Content III-2

Activities

Weather

High in the Clouds

Standard III:

Students will develop an understanding of their environment.

Objective 2:

Observe and describe weather.

Intended Learning Outcomes:

1. Demonstrate a positive learning attitude.
6. Communicate clearly in oral, artistic, written, and nonverbal form.

Content Connections:

Math III-3; Collect, record and organize data
Language Arts VIII-2; Compose a written draft
Content I-3; Express personal experiences

Content Standard III

Objective 2

Connections

Background Information

Students should know that rain and snow come from the sky and/or clouds. Teachers should know the different types of clouds: fair weather clouds (cumulus), rain clouds (cirrus and stratus), and storm (cumulonimbus) and what weather comes from each cloud. Cumulus means "heap" in Latin; they are dark gray, low-level clouds forming at 2,000-4,000 feet and are mostly made of water droplets. Stratus means "layer" in Latin; they are also low-level clouds forming up to 6,500 feet and are a low, lumpy layer that can produce weak precipitation. Cirrus means "curl" in Latin; they are high-level clouds forming above 20,000 feet and are primarily formed of ice crystals. Cumulonimbus means "curl" in Latin; they are mid-level clouds forming at 1,600-39,000 feet, and are large, vertical storm clouds. The tops of the cumulonimbus clouds can reach 39,000 feet. They can develop into large, powerful thunderstorms.

Research Basis

Margulies, N., (2001). Visual Thinking: Symbolic Ways Of Representing Ideas: A Need For More Symbols. *New Horizons for Learning*, Sept/Oct/Nov/Dec 2001, Vol. VII, No. 4

As Aristotle said, "The soul never thinks without a mental image." Our culture is one that communicates with icons and symbols. Symbols and icons allow you to see parts of the whole. Making ideas visible with both images and words is our process of thinking.

Margulies, N., (2001). Mindscaping: A Learning and Thinking Skill for All Students. *New Horizons for Learning,* Sept/Oct/Nov/Dec 2001, Vol. VII, No. 4

Mindscaping is a way to make visual maps. It is a tool used to record ideas and understand what you hear. Mindscaping is a form

of note taking that engages the student to make sense of what is being taught without writing long sentences and having a wandering mind.

Invitation to Learn

Have pictures of the different type of clouds—fair weather, rain and storm (cumulus, cirrus, stratus, and cumulonimbus)—hanging randomly around the room. Ask students to sit under the cloud that matches their mood right then. Ask how students decided where to sit. This is a good pre-assessment to see how much the students know about the different cloud types.

Instructional Procedures for Clouds

Materials

- ❑ *The Man Who Named the Clouds*
- ❑ *Cloud Key Wheel*
- ❑ *Cloud Finder*
- ❑ Paper plates
- ❑ Metal fasteners
- ❑ *Cloud Droplet Estimation*
- ❑ Large Cotton Balls
- ❑ Blue construction paper
- ❑ Glue
- ❑ Pictures of clouds
- ❑ *It Looked Like Spilt Milk*

1. Pull out the pictures of storm clouds, rain clouds, and fair weather clouds. Ask students to share what they know about one or all clouds. Read parts of the book *The Man Who Named the Clouds,* by Julie Hannah and John Holub, to your students.
2. Ask students to write down the names of the different cloud types in their science journals. Have them take notes as you discuss the characteristics of each cloud type. A good way to organize the cloud notes in their science journals is to have your students make a T-chart. Students can write information about the clouds on one side of the T-chart and on the other side students can draw a picture of the clouds next to the written information. Fair weather clouds (Cumulus) are made of tiny water droplets, tall, puffy, and bright white in color with sun shining on it. Rain clouds (Cirrus)—water collects to form the curves, no clear shape, looks like curls of hair or string, high in the sky, most water droplets turn to tiny ice drops. Weak rain clouds (Stratus)—Lumpy layered clouds, holds little water moisture, and produces weak rain storms. Thunder storm clouds (Cumulonimbus)—can't hold all water droplets, tall, puffy and gray. Rain, hail, and snow fall when heavy in the cloud. (Use the background information to describe each cloud type.)
3. Cloud in a Bottle—Fill a two-liter bottle one-third full of warm water and put on the cap. As the water evaporates, it adds water vapor to the bottle. Shake the bottle to get rid of the condensation on the sides. Remove the cap, light a match and drop it in the bottle and quickly put the cap back on. Slowly squeeze the bottle, then release. (The squeezing represents the warming in the atmosphere and the releasing represents the

cooling.) A cloud will appear as you release, and disappear as you squeeze. Explanation: Water vapor can be made to condense into the form of small cloud droplets. By adding particles such as smoke, it enhances the process of water condensation; by squeezing the bottle, it causes the air pressure to drop.

4. Ask your students if they have ever seen their breath when they are outside. Tell them that when they blow out the warm air from their mouth they make a cloud. A cloud is when warm air hits cold air and forms water droplets.
5. Make a cloud wheel for students to identify the different clouds in the sky. Each student will receive the *Cloud Key Wheel* and *Cloud Finder* handouts. Have students cut out the *Cloud Key Wheel* and two window parts of the wheel. Next, have the students cut out the *Cloud Finder* circle. Have students glue the *Cloud Finder* circle to a paper plate for stability. Use a fastener to fasten the two circles together with the *Cloud Finder* on the bottom and the *Cloud Key Wheel* on the top with a fastener. Invite students to go outside and search for different cloud types. Ask them to identify a cloud type in the sky and find it on their Cloud Wheel. Come back into the classroom and have students share what cloud types they found. Are they all the same? This is a great way to enhance discussion on clouds and check for understanding.
6. Pass out one piece of blue construction paper and one large cotton ball to each student. Students are to make the different cloud types on their blue paper using *only* one cotton ball and glue. Have students place the clouds in order from high-level clouds to surface clouds. Students may use their science journals to help them with this task.
7. After reading *It Looked Like Spilt Milk,* by Charles G. Shaw, students will create a page in a class book. Materials: blue construction paper, white paint and white crayons. Have students fold their paper horizontally, (hamburger), then open their papers to lay flat. The teacher will put some paint in the middle of the students' paper. The student will fold their paper and smooth out the paint. The student will open their paper and describe what they see. Have your students get out their science journals and write down what they see. Let the paint dry over night. The next day, students will write *'It looks like…'* on their paper. The teacher will bind the book and display it in class.

8. After each student has made a cloud for the class book, have your students make a cloud poem about their cloud they made. Cloud Poems: title-name of cloud, first line—three adjectives that describe the cloud, second line—three verbs related to the cloud, third line-a phrase that tells about the cloud, fourth line—name of the cloud or synonym.

Instructional Procedures

Materials

- ❑ *Now I Know What Makes the Weather*
- ❑ *A Drop Around the World*
- ❑ White packing peanuts
- ❑ Clear boondoggle
- ❑ Beads
- ❑ Clear glass jar
- ❑ Hot plate
- ❑ Pie tin
- ❑ Ice cubes
- ❑ Science journal
- ❑ Water
- ❑ *Thunder Cake*
- ❑ *Cloud Droplet Estimation Page*

1. Read *Now I Know What Makes the Weather,* by Janet Palazzo, to your class.
2. Ask where weather comes from. List the weather words and pictures on the board. This will create a discussion about clouds and the weather that comes from clouds.
3. Before starting the Weather Demonstration, talk about how weather is always changing, and by doing the weather demonstration you will show students how clouds pick up and drop moisture (water). For the Weather Demonstration; ask for two volunteers. Student One will act as the cloud and Student Two will be the rain. Lay packing peanuts on the ground and tell Student Two to pick up the peanuts and start to fill Student One's cupped hands with them. Student One waits until his/her hands are over flowing with packing peanuts before he/she separates his/her hands and lets the packing peanuts fall to the ground. Student Two starts all over by picking up the packing peanuts and placing them in Student One's hands again.
4. A Recipe for Weather Activity: Have your students pull out their science journals. Tell your students that they will be making a recipe of weather for a nice day, rainy day, or stormy day. Brainstorm some possible ingredients on the board to get students thinking. Some possible ingredients for fair day weather are: blue skies, puffy white clouds, song birds, people outside, sunshine, light breeze and warmer air. Stormy days: dark skies, colder air, dark clouds, heavy wind (2 cups wind), little to no people outside, sound of distant thunder. Rainy days: dark skies, gray clouds, little wind (1 cup wind), cool air, fewer people outside, sound of distant thunder. Go over the format of a recipe. All ingredients are at the top with the desired amounts. Instructions/directions are down below, written in complete sentences.
5. Make weather bracelets. Start with white for clouds, blue for rain, clear for wind, yellow for sun, red for temperature, gold for thunder/lightning. Each bead represents a type of weather.

6. Read the book, *A Drop Around the World*, by Barbara Shaw McKinney, to your class.
7. Make rain in a jar. Heat up water to a boil using a hot plate (check with building coordinator to okay the use of a hot plate in classroom). Place boiling water in a clear glass jar. Take a metal pie tin and place on top of the opening of the jar. Fill the pie tin with ice cubes. Watch what happens as the ice cubes begin to melt and cool down the jar of hot water. Explain that rain is formed when warm air from Earth (our jar) meets cold air from the sky (our ice cube in the pie tin).
8. What makes a drop of rain? Have students tell you what a raindrop is made of. Lead them into a discussion that tells them that every raindrop is made of water droplets. Ask your students to estimate how many water droplets are in one drop of rain. Hand out the *Cloud Droplet Estimation Page* to your students. Have your students estimate how many droplets are in the drop of rain on their page. Next, have your students circle groups of 5 or 10 droplets in the clouds. How many were really there? Did your students make a good estimation? Tell students that a drop of rain has as many as one million droplets in it!
9. Read *Thunder Cake*, by Patricia Palocco to your class. Talk about the different sounds you hear when it starts to storm.
10. Make the rain song by making the sounds of rain, thunder and lightening. Divide your class into five groups. Group one starts by rubbing their hands together—the sound of thunder rolling in. Group two gently blows air out of their mouth—the sound of wind. Group three snaps their fingers—the sound of rain falling to the ground. Group four stomps their feet—the sound of thunder. Lastly, group five claps their hands loudly—the sound of lightning.

Assessment Suggestions

- Ask students to share what type of weather words are represented by each color bead on their weather bracelet.
- Was each cloud represented in the cotton ball picture? Were they in the correct height order?
- Read through the students "Life as a Raindrop" stories.
- Have a big "Cooking Pot" for weather in your classroom. In the pot, place ingredients that are and are not for a good day or

rainy day. Ask students to sort out the "real" ingredients from the "fake" ingredients.

Curriculum Extensions/Adaptations/ Integration

- Students can write a life story of a raindrop or snowflake as it goes through its life.
- Make rain in class to show students how rain forms. See instructions above.
- Make a class graph of each student's favorite cloud. Have each student draw his or her favorite cloud on a 3 x 3 inch square. Graph the class results.
- Are all raindrops the same? Wait for a rainy day to try this observation. Go outside when it is raining. Hold a piece of black construction paper out in the rain to gather raindrops. Bring the paper inside and look at the spots made by the rain. What do you see?
- Make water cycle bracelets. Start with a light blue bead for rain, add a green bead for grass (accumulation on the ground), add a yellow bead for the sun to start the process for evaporation, add a clear bead to finish evaporation, and finally add a white bead for clouds (accumulation of water vapors). Provide instructions in a step-by-step process to clarify order and delivery of content.
- Read *The Snowflake: A Water Cycle Story,* by Neil Waldman, or *A Drop Around the World,* by Barbara Shaw McKinney, to your class. Explain to students that the water cycle is a never-ending cycle. Teach them the simple water cycle song and hand movements to remember all stages in the water cycle: Evaporation (hands go up), accumulation (fingers form a cloud above their head), precipitation (fingers 'rain' down)—when it rains, sung to La Cucaracha. Have some students shake the hand maracas as the song is sung.
- Make a class recipe book out of the recipes your students made for weather.

Family Connections

- Encourage your student to watch the weather forecast on television with you at night.

- Listen to the weather in the morning together and let your student choose appropriate clothes to wear to school.

Additional Resources

Books

Now I Know What Makes the Weather, by Janet Palazzo; ISBN 0-89375-655-5

The Kids' Book of Clouds and Sky, by Frank Staub; ISBN 1-4027-2806-9

The Man Who Named the Clouds, by Julie Hannah and John Holub; ISBN-13: 978-0-8075-4974-2

A Drop Around the World, by Barbara Shaw McKinney; ISBN 1-883220-72-6

The Snowflake: A Water Cycle Story, by Neil Waldman; ISBN 0-7613-2347-3

Clouds, by Marion Dane Bauer; ISBN 0-689-85441-2

Rain, by Marion Dane Bauer; ISBN 0-689-85439-0

The Cloud Book, by Tomie dePaola; ISBN-10: 0823405311

The Rain Came Down, by David Shannon; ISBN 13: 9780439050210

It Looked Like Spilt Milk, by Charles G. Shaw; ISBN 0-06-443159-2

Wacky Weather, by John Malam and Steve Fricker; ISBN 0689811896

Puddles, by Jonathan London; ISBN 9780140561753

The Water Cycle, by Helen Frost; ISBN 0-7368-0409-9

Clouds, by, Ted O'Hare; ISBN 1-58952-570-1

Down Comes the Rain, by Franklyn M. Branley; ISBN 0-613-04877-6

Cloudy With a Chance of Meatball, by Judi Barrett; ISBN 0-590-30384-8

Thunder Cake, by Patricia Palocco; ISBN 0-698-11581-3

Web sites

www.scholastic.com/weather

http://teacher.scholastic.com/activities/wwatch/

http://ww2010.atams.uiuc.edu/(Gh)/guides/mtr/cld/cldtyp/home.rxml

http://www.weatherwizkids.com/cloud.htm

http://vortex.plymouth.edu/clouds.html/

http://www.wildwildweather.com/clouds.htm

http://www.teachingheart.net/weather.htm

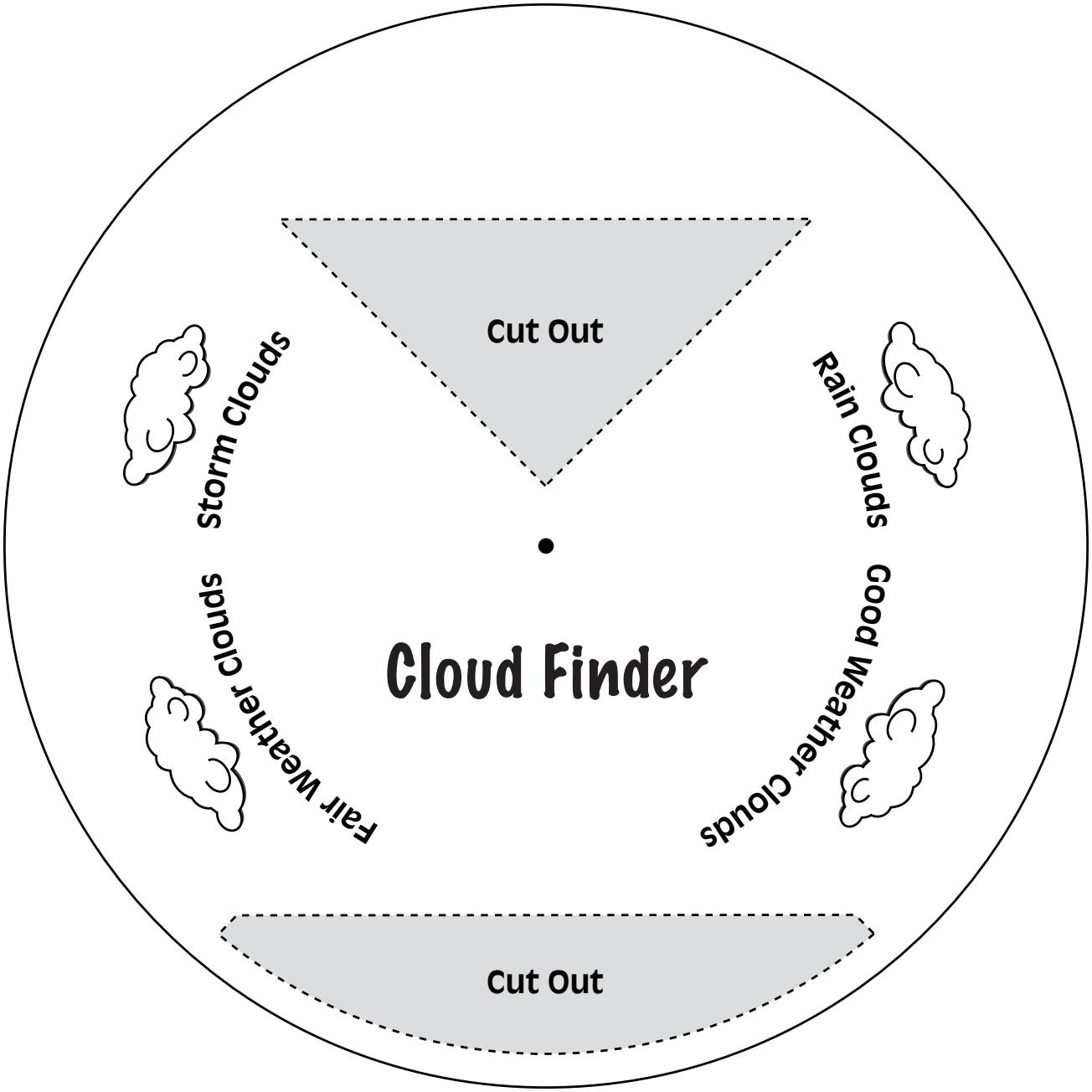
http://www.geocities.com/jbaker2404/weather.html

http://sln.fi.edu/tfi/units/energy/dixie.html

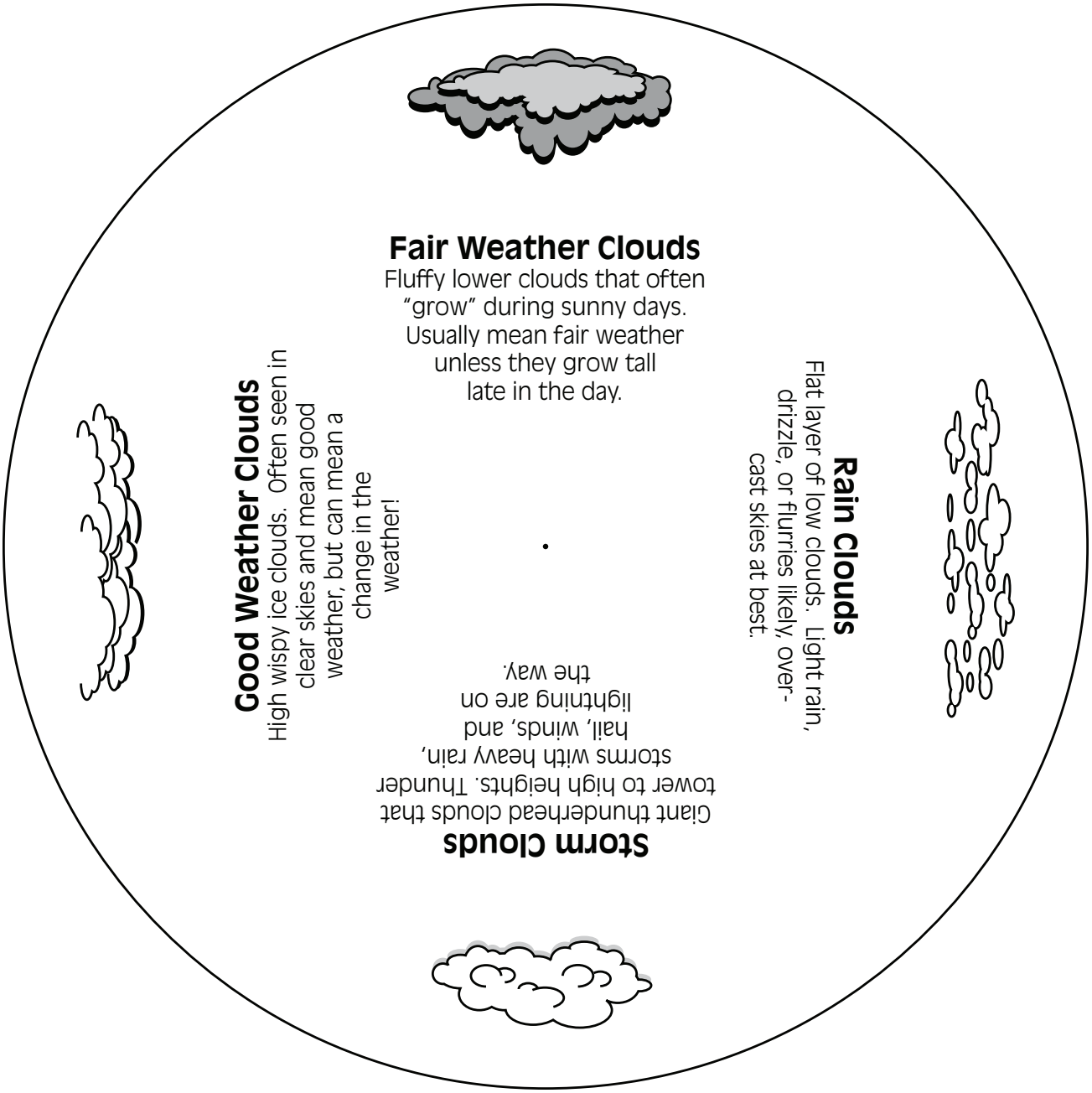
www.energyquest.ca.gov/projects/thermometer.html

Cloud Key

Cut out the wheel. Cut out the two shaded areas inside the wheel. This is the top wheel of your Cloud Key.



Cloud Key


Fair Weather Clouds
Fluffy lower clouds that often "grow" during sunny days. Usually mean fair weather unless they grow tall late in the day.
Good Weather Clouds
High wispy ice clouds. Often seen in clear skies and mean good weather, but can mean a change in the weather!
Rain Clouds
Flat layer of low clouds. Light rain, drizzle, or flurries likely, overcast skies at best.
Storm Clouds
Giant thunderhead clouds that tower to high heights. Thunder storms with heavy rain, hail, winds, and lightning are on the way.

Name _____

Drop Estimation Page

1. How many droplets are inside this rain drop?

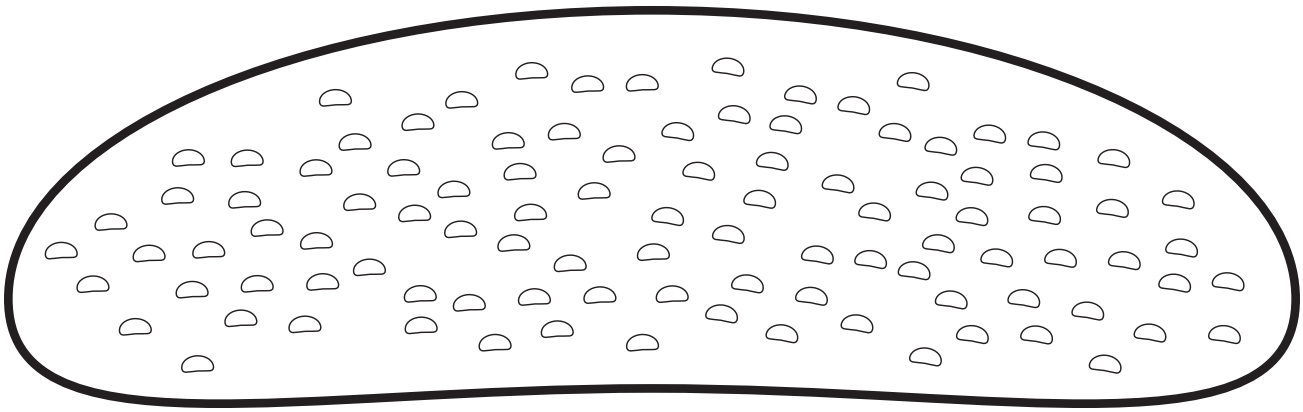
   My estimate _____

2. Circle groups of 10 droplets. Count by tens.

   There are _____ groups of 10 in this rain drop.

3. How many droplets are inside this rain drop?

   My count _____



Weather Wizards

Standard III:

Students will develop an understanding of their environment.

Objective 2:

Observe and describe weather.

Intended Learning Outcomes:

1. Demonstrate a positive learning attitude.
5. Understand and use basic concepts and skills.
6. Communicate clearly in oral, artist, written, and nonverbal form.

Content Connections:

Math III-3; Collect, record and organize data

Content Standard III

Objective 2

Connections

Background Information

Weather is the condition of the air that surrounds Earth. Meteorologists can predict the weather by using certain tools such as a thermometer, which measures the temperature; a wind vane, which tells from what direction the wind blows; an anemometer which measures the wind speed; and a barometer, which measures air pressure.

Storms come from clouds, and they display themselves in many forms including the following: Rain (water falling from the sky), hail (ice chunks), snow (ice crystals), sleet (a mixture of rain and snow), fog (droplets of water vapor suspended in the air near the ground), tornados (violently destructive windstorms), and hurricanes (severe tropical storms that include heavy rain and wind).

Research Basis

Johnson, D., Johnson, R. (1999). Making Cooperative Learning Work. *Theory into Practice,* Vol. 38, No. 2, Building Community through Cooperative Learning. (Spring, 1999), pp.67-73.

Formal cooperative learning is when students work together for one class period or several weeks to achieve shared learning goals and complete specific tasks and assignments. Informal cooperative learning is when students work together temporarily to achieve a joint learning goal. These groups may last only a few minutes. The five essential elements of cooperative groups are as follows: Positive interdependence, individual accountability, face-to-face interaction, social skills, and group processing.

Winn, J.A. (1994). Promises and Challenges of Scaffolded Instruction. *Learning Disability Quarterly*, Vol. 17, No. 1. (Winter 1994), pp. 89-104.

Scaffolded instruction includes challenging students to engage in tasks that they are unable to complete independently, and providing the support needed to enable students to successfully carry them out.

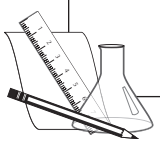
Invitation to Learn

Distribute the worksheet entitled *Find Someone Who* to each student. Tell them to read each storm statement and then find someone in the class who has experienced the described statement and have him/her sign his/her name on the corresponding statement. Tell the students that their goal is to see how fast they can fill up their paper with the different names from the class. This is a good way to get students up and moving and start a discussion about storms.

Instructional Procedures

Materials

- ❑ *What Will the Weather Be?*
- ❑ 3 ounce paper cups
- ❑ New sharp pencil
- ❑ Plastic straws
- ❑ Scissors
- ❑ Stapler
- ❑ Straight pins
- ❑ Single paper punch
- ❑ Wide mouth container
- ❑ Balloon
- ❑ Rubber band
- ❑ Cardboard
- ❑ Tape
- ❑ Index cards
- ❑ *It's Raining Cats and Dogs*
- ❑ Small portable fan
- ❑ *Find Someone Who*
- ❑ *Weather Reporter Page*



1. Read *What Will the Weather Be?,* by Lynda DeWitt, to your students.
2. Talk about the job of a Meteorologist. Can weather be predicted? Do meteorologists really know exactly what the weather will be like? Meteorologists need to know what kind of air is coming, and be able to plan and prepare for the weather that follows.
3. Talk about the tools a meteorologist uses to help predict the weather: A thermometer, which measures the temperature; a wind vane, which tells from what direction the wind blows; an anemometer, which measures the wind speed; and a barometer, which measures air pressure. (In my classroom I have a daily Weather Reporter who reports on the temperature for the day, checks the wind direction, checks the wind speed and checks the air pressure using our classroom weather tools.)
4. Make an anemometer with your students. Each student will need five 3 oz. paper cups. Instruct them to punch a hole one-half inch below the rim of four of the cups. Tell them to punch out four equally spaced holes about one-fourth inch below the rim of the fifth cup. Tell them to punch a hole in the center of the same cup. Take one of the single holed cups and push a plastic straw through the hole. Fold the inserted end of the straw so that it lies on the inside of the cup across from the hole and then staple it. Repeat this procedure with another one of the single holed cups and the second straw. Tell them to

slide one cup and straw assembly through two opposite holes of the cup with four holes. Tell them to push one of the single holed cups onto the end of the straw that was just pushed through the four-holed cup. Bend the straw and staple it to the single holed cup after making certain that the cup faces in the opposite direction from the first cup. Tell them to repeat this procedure using the other cup and straw assembly and the remaining single holed cup. Have them align the four cups so that their open ends face in the same direction (clockwise or counterclockwise) around the center cup. Tell them to push the straight pin through the two straws where they intersect. Tell them to push the eraser end of a pencil through the bottom hole in the center cup and push the pin into the end of the pencil eraser as far as it will go. Tell them that their anemometers are ready to use. Take the students outside and find somewhere they can stick their anemometers into the ground and have them observe what happens. This is a great way to generate a class discussion on wind speed.

5. Make a barometer with your class. Cut the neck off of a balloon and stretch it over the mouth of a jar. Fasten it tightly with a rubber band so the air can't get out. Cut off one end of a straw to make it pointed. Stick the other end to the middle of the stretched balloon using tape. Tape a piece of cardboard behind the jar so the pointer touches it. Make a mark at the point. Draw a scale above and below this mark from 1 to 10. This is your starting measurement for air pressure. Explanation: The barometer shows when the air pressure outside the jar becomes higher and lower. When it becomes higher, the air pushes hard on the balloon so the straw points up. When the air pressure is lower the air inside the jar pushes up on the balloon more than the air outside pushes down. This causes the straw to move so it points down. Have students keep a record in their journals on the daily barometer readings.
6. Make a wind vane with your students. Cut a point and tail of an arrow out of an index card. Tape them onto the ends of a straw. Push the pin through the middle of the straw and put the pin into the eraser of a pencil. Make sure the straw can turn freely. Take your students outside and find a spot where they can stick their wind vanes in the ground. Observe the wind direction on the wind vanes. What do you see?
7. Discuss the types of storms that come from clouds, such as rain, snow, wind, fog, hail, sleet, tornados, and hurricanes. Make a class graph of "Storms We Don't Like."

8. Introduce the *It's Raining Cats and Dogs* experiment. The idiom *'Raining Cats and Dogs'* comes from the 1500's. Dogs and cats used to hide in the roofs of houses to keep warm. The roofs in the houses in the 1500s were thatch roofs—thick straw, piled high, with no wood underneath. They were the only place for the little animals to get warm. So all the pets; dogs, cats and other small animals, mice, rats, bugs, all lived in the roof. When it rained it became slippery so sometimes the animals would slip and fall off the roof, thus the saying, "it's raining cats and dogs." Tell the students to get with a partner to cut out their dog/cat raindrop. Students will drop their raindrop to the ground and graph which side it lands on. What are the results? Compare with other students in the class.
9. Wind exploration class experiment. Make a chart and title it "Will the Wind Blow It?" Subtitle the two columns YES and NO. Ask students to find objects in their desk or around the room to test if the air can move them. Turn on a small portable fan and set it on a table, desk or cart. Have students come up and drop their object in front of the fan. Watch what the air does to the object. If their object falls to the ground, students will place their object to the side of the chart labeled NO. If the fan moves their object, students will place their object to the YES side of the chart.

Assessment Suggestions

- Watch to see how students put together their wind vanes. Does the wind push the arrow in the direction of the wind?
- Look to see how students filled out their *It's Raining Cats and Dogs* chart. Were they able to record the way the raindrop fell?

Curriculum Extensions/Adaptations/ Integration

- Making Fog in a Jar - Fill a glass jar full of hot water. Wait one minute and pour out the water leaving only one inch in the bottom. Put a strainer over the top of the jar. Place three to four ice cubes in the strainer. Watch as fog appears. Explanation: The cold air from the ice cubes collides with the warm, moist air in the bottle causing the water to condense and form a fog.
- Bottle Tornado - Fill one two-liter bottle two-thirds full of water. Add food coloring to the water for easier observation.

Place another two -liter bottle on top of the bottle filled with water. Duct tape the two openings together. Turn the bottle with water upside down and make quick circular movements. As the water leaves the bottle through the small opening, stop the circular movements and watch the tornado move from one bottle to the other. Explanation: The swirling motion you give the bottle forms a vortex like an actual tornado.

- Hurricane Movement - Cut a spiral from a sheet of paper. Sew a piece of thread through the top. Turn on a lamp. Hold the thread directly above the light bulb. Watch the movement of the spiral. Explanation: The life of a hurricane begins when the hot tropical sun heats up the air over the ocean and the hot air rises.
- Lightning and Static Electricity - Sprinkle some pepper on a plate. Blow up a balloon; tie it off. Rub the balloon on your hair, a sweater or carpet. Hold the balloon above the plate and slowly lower it towards the pepper. What happens? Now add some water to the plate and sprinkle it with some more pepper. Blow up the second balloon and rub it on your hair, a sweater or carpet. Predict what you think will happen when you lower the balloon over the plate. Explanation: Lightning is caused by static electricity. Static electricity is an electrical charge that is produced when two things rub together.
- Snow Fall versus Rain Fall - materials: Two equal sized pieces of paper and a chair. Crumple up one piece of paper. This is your raindrop. Get another piece of paper to represent a snowflake. Stand on a chair. Hold the crumbled paper in one hand and the other piece of paper in the other. Let go of the two pieces of paper at the same time. Did the rain fall faster or did the snowflake? What role does the shape of the raindrop and that of the snowflake play in this experiment?

Family Connections

- Wet chalk drawings: Use black or dark colored paper. Have your student dip colored chalk in a sugar water mixture and color with the chalk. The sugar water makes the chalk colors more vibrant. This activity demonstrates how vibrant colors are a rainbow.
- Help your student fill out the *Weather Reporter Page* the night before for the next day's weather.

Additional Resources

Books

What Will the Weather Be?, by Lynda De Witt; ISBN-13: 978-0-06-445113-0

Storms, by Seymour Simon; ISBN 13: 9780688117085

Tornado Alert, by Franklyn M. Branley; ISBN 0064450945

Flash, Crash, Rumble, and Roll, by Franklyn M. Branley; ISBN 0-8085-3579-X

Henry and Mudge And the Wild Wind, by Cynthia Rylant; ISBN 0-689-80838-0

Snow, by Marion Dane Bauer; ISBN 0-689-85437-4

Wind, by Marion Dane Bauer; ISBN 0-689-85443-9

Feel the Wind, by Arthur Dorros; ISBN 0064450953

Puddle Jumpers: Fun Weather Projects for Kids, by Jennifer Storey Gillis; ISBN: 0882669389

Web sites

www.scholastic.com/weather

http://teacher.scholastic.com/activities/wwatch/

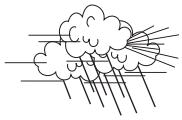
http://www.weatherwizkids.com

http://www.wildwildweather.com

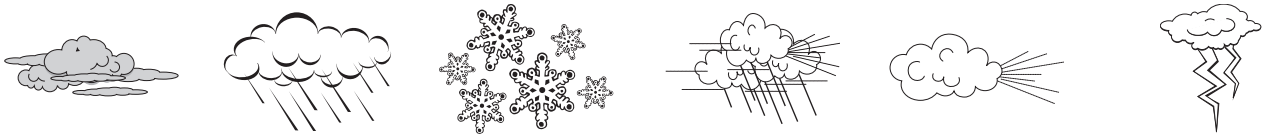
www.energyquest.ca.gov/projects/thermometer.html

Find Someone Who...

Directions: Find someone who has personally experienced the described storm before. Ask him/her to sign his/her name on your paper. You may not repeat any names and you may not use your own name to fill a spot. When finished, bring your paper to your teacher. Good Luck!

1. Find someone who has been in a snow storm before _____ 
2. Find someone who has been in a rain storm before _____ 
3. Find someone who has been in a blizzard before _____ 
4. Find someone who has been in a lightning storm before _____ 
5. Find someone who has been in a wind storm before _____ 
6. Find someone who has been in a tornado before _____ 
7. Find someone who has been in a hurricane before _____ 
8. Find someone who has driven in fog before _____ 
9. Find someone who has been in a hail storm before _____ 
10. Find someone who has been in a sleet storm before _____ 

Weather Reporter



Weather Reporter's Name _____

Today is _____.

The temperature outside right now is _____.

The high for today will be _____. The low for today will be _____.

Today will be (partly cloudy, cloudy, rainy, windy, sunny, snowy) _____ with a chance of (snow, rain, wind, sleet, hail) _____.

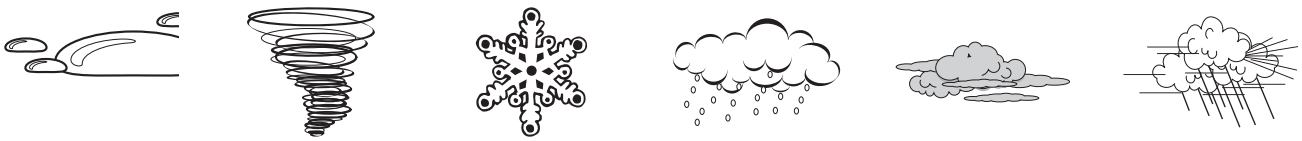
The cloud formation outside is (good weather, rainy or stormy clouds) _____.

The barometer is (high, low, average) _____ today.

The wind vane is pointing (North, South, East, West) _____.

The anemometer is/is not spinning today. It is moving (fast, slow) _____.

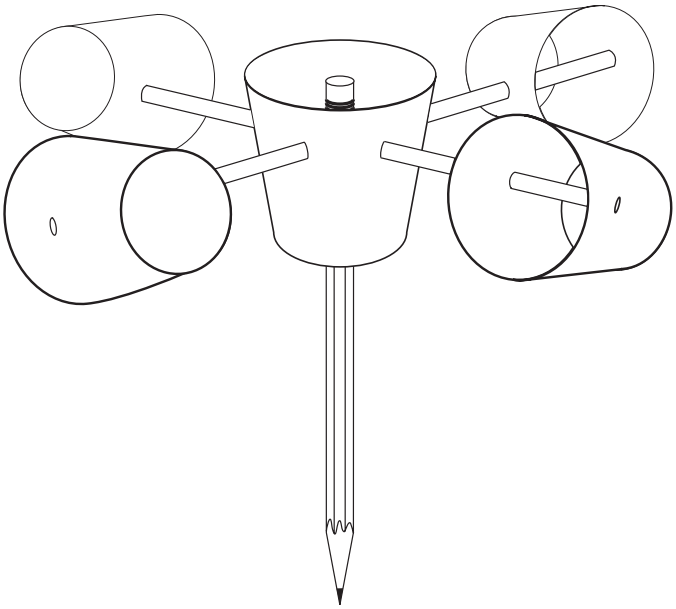
Suggested clothing for today would be _____.



Anemometer

Materials

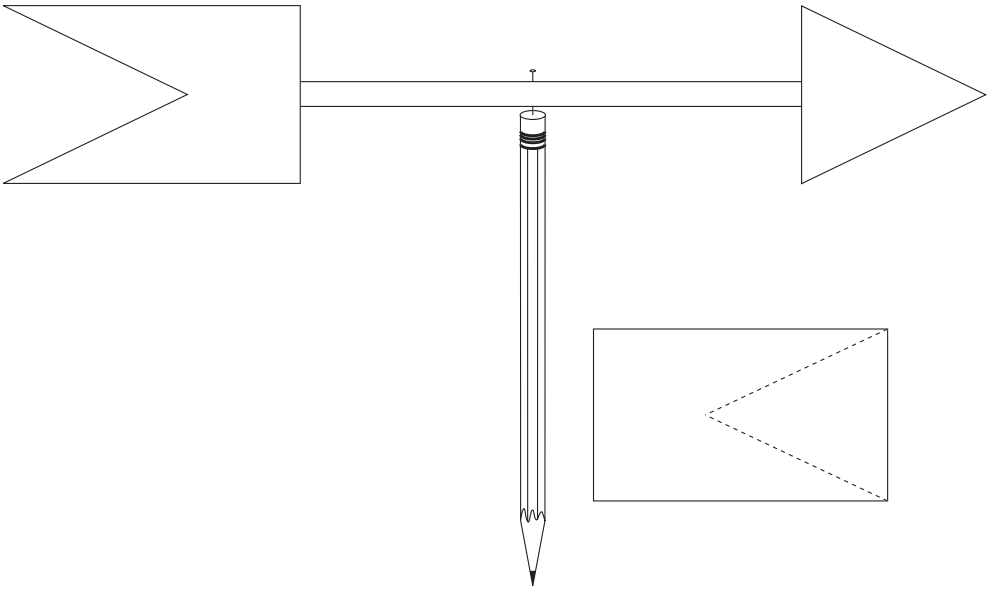
five 3 ounce paper Dixie cups
two straight plastic soda straws
a pin
scissors
paper punch
small stapler
sharp pencil with an eraser



Wind Vane

Materials

1 straw
1 straight pin
1 index card
pencil with eraser
tape
scissors



Math III-1

Activities

Classifying Shapes

Shapes Galore

Standard III:

Students will understand simple geometry and measurement concepts as well as collect, represent, and draw conclusions from data.

Objective 1:

Describe, classify, and create geometric figures.

Intended Learning Outcomes:

1. Demonstrate a positive learning attitude.
5. Understand and use basic concepts and skills.

Content Connections:

Language Arts VI-1; Math vocabulary words

Math Standard III

Objective 1

Connections

Background Information

Students will be able to recognize the characteristics of the various geometric shapes. They will be given many opportunities to classify shapes according to the number of sides, angles or faces, edges, and vertices. Students should be given opportunities to find shapes in their environment. They will be able to communicate the attributes of the different shapes.

Research Basis

Van Hiele, P.M. (l999). Developing geometric thinking through activities that begin with play. *Teaching Children Mathematics*, February 1999, p. 310-316.

Van Hiele developed three stages of geometric thinking. The first level of thinking is called the visual level where figures are judged only by their appearance. Next, is the descriptive level where children are able to identify figures because of certain properties. Finally, there is the informal deduction level where students use knowledge about one figure to deduce information about another. In order for children to progress through these three stages, instruction should begin with inquiry or play.

Fennell, R. (1990) Implementing the standards. *Arithmetic Teacher*, p.18-22.

Francis Fennell emphasizes that classroom activities should involve physical material and provide opportunities for questioning, problem solving, and discussion.

Materials

- ❑ Object from home
- ❑ Word Cards
- ❑ *Sticky notes*
- ❑ *Table*

Invitation to Learn

Students will bring an object from home. (The object needs to be a geometric shape: square, circle, triangle, rectangle, trapezoid, rhombus, parallelogram, pentagon, hexagon, cube, sphere, cone.) Write the name of the object on a sticky note and place it on the graph.

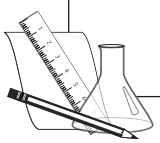
Discuss the findings of the graph.

Place the objects in a shape museum. This can be any place in your classroom that the students can go and visit and look at the different shapes.

Instructional Procedures

Materials

- ❑ *Venn Diagram*
- ❑ *Word strips*
- ❑ *Label for shapes*
- ❑ *Picture of shapes*



Compare/Contrast Shapes

1. Select 2 shapes such as a square and triangle or a trapezoid and rectangle.
2. Divide the class into 2 groups. Have one set of students write an attribute on a word strip for one of the shapes and the next set of students write an attribute on a word strip for the other shape.
3. Place the word strips on the Venn Diagram Pocket Chart under the correct shape. Review the attributes to make sure they are correct. Discuss the attributes with the students.
4. Review the attributes. If there are any word strips that are the same on both sides, place them in the middle of the Venn Diagram. Discuss how some shapes have attributes that are the same and others that are unique to that shape.

Materials

- ❑ *Shape Definition Cards*
- ❑ *Shape Word Cards*
- ❑ *Shape Picture Cards*

Shape Concentration

Play concentration with 2 of the sets of Shape Cards. Place the cards in a 3 x 3 array. Place the rest of the cards in a draw pile. Children take turns turning over 2 cards at a time. If the cards match the name with the definition or the picture, it is a match and the child keeps the cards. The empty spaces are filled with 2 cards from the draw pile. Play continues until all the cards have been matched.

Materials

- ❑ *Bingo Cards*
- ❑ *Bingo Chips*
- ❑ *Shape Word Cards*
- ❑ *Shape Definition Cards*

Shape Bingo

Each child has a Bingo Card. As a shape or definition is read the student places a bingo chip on that space. After a row is complete, the students calls out Shape Bingo. Students need to name the shapes in their winning row and/or an attribute of each shape. Do the activity several times.

Shape Walk

Materials
- ❑ *Shape Walk*
- ❑ Clipboard

1. Students will go on a Shape Walk around the classroom, school, or neighborhood.
2. As students locate a shape they can write or draw it on their recording sheet.
3. As the students are on their Shape Walk they can sing the Shape Hunt Chant.

Shape Hunt Chant

(Adapted from the traditional children's song Going on a Bear Hunt)

Going on a shape hunt,

Leaving right away.

If it doesn't rain,

We'll stay all day.

Teacher: *Do you see a circle?*

Students: *Yes, we see a circle.*

Going on a shape hunt,

Here we go.

4. After the Shape Walk, discuss the different shapes that they observed. Which shape was the most common shape found? Which was the shape most difficult to find?

Pattern Block Picture

Materials
- ❑ Pattern blocks
- ❑ Paper
- ❑ Glue

The students will create a picture or design using the various pattern blocks shapes.

Journal Activities

Materials
- ❑ *Picture Dictionary*
- ❑ *Venn Diagram*
- ❑ *Mathematical Term*

Picture Dictionary - Draw a picture of the shape and write 1 or 2 attributes for each shape.

Venn Diagram - Choose 2 geometric shapes. Write 3 or 4 attributes for each shape. If they have any of the same attributes place them in the center of the Venn Diagram.

Mathematical Term - Worksheet is divided into 4 squares. In the first square they write the word of the shape. In the second square they write the definition. In the third square they draw a picture of their shape, and in the last square they draw an example of that shape.

Materials

Geoboards

- ❑ Geoboards
- ❑ Geobands
- ❑ Geometric shape cards

Sorting Shapes

- ❑ Geometric shape photos

Shape Cover-Up

- ❑ *Triangle Cover-up*
- ❑ *Hexagon Cover-u*p
- ❑ Pattern blocks

Shape Detective

- ❑ Clue Cards
- ❑ Geometric shape chart
- ❑ Shape Detectives

Shape Rubbings

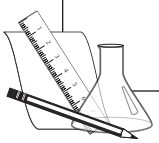
- ❑ Die cut shapes
- ❑ Glue
- ❑ Paper
- ❑ Crayons

Tangram Letters and Numbers

- ❑ Tangram shapes
- ❑ *Tangram Chart*

Last Block

- ❑ *Shape Definition Cards*
- ❑ *Shape Word Cards*
- ❑ *Shape Picture Cards*



Centers Full of Shapes

1. Geoboards

Students will use the geometric shape cards to create the various shapes on their geoboards.

2. Sorting Shapes

Students will sort photographs of geometric shapes found in their environment.

3. Shape Cover-Up

Use the pattern blocks to cover the large triangle or hexagon. Fill in the chart to show how many of each shape you used. Cover the shape again using a different combination of shapes. Complete the graph on your worksheet.

4. Shape Detective

Choose a card and read the clues. Looking at the shape chart find which one fits the clues. Record your answer next to the matching card number on the recording sheet.

5. Shape Rubbings

Choose 4-6 shapes. Glue them onto your paper making sure that they overlap on one side or corner.

Place a piece of paper over your shape design. Choose 3 or 4 different colors of crayons, then rub them over the paper.

6. Tangram Letters and Numbers

While looking at the chart or pictures, create the various numbers and letters using the tangram shapes.

7. Shape Concentration

Play concentration with 2 sets of shape cards. Place the cards in a 3 x 3 array. Children take turns turning over 2 cards at a time. If the cards match the name with the definition or the picture it is a match and the child keeps the cards. The empty spaces are filled with 2 cards from the draw pile. Play continues until all the cards have been matched.

8. Last Block

Materials

- ❑ Pattern blocks
- ❑ *Last Block . . .*

The object of the game is to be the last person to place a pattern block on the game board. Students play in groups of two. The student's name that comes first in the alphabet places the first block on the game board. They then take turns placing a pattern block on the game board. The last person to place the last block on their game board is the winner.

9. Pattern Block Game board

Materials

- ❑ Blank game board
- ❑ Shape stamps
- ❑ Gamepad markers
- ❑ Pattern block dice

Create a game board (use a file folder, game board, stickers or stamps). Two children play on a game board. The first child rolls the dice and moves to that space on their game board. It is then the next child's turn. The first child to reach the end of the game board is the winner.

Assessment Suggestions

- Have students draw the different geometric shapes for pre or post assessment.
- Have students create a Venn Diagram using two different shapes.
- Journal Activities.
- Observe how the students participate in the various activities.

Curriculum Extensions/Adaptations/ Integration

- List the attributes for a geometric shape.
- Work with tangrams.
- Write poems about the different shapes.

Family Connections

- Go on a shape walk around your home or neighborhood.
- Tell your family the different attributes for the various geometric shapes.
- Create something using geometric shapes.

Additional Resources

Books

Shapes and Patterns, by Jerry Pallotta; ISBN 9780545002400

The Greedy Triangle, by Marilyn Burns; ISBN 0590480017

Bear in a Square, by Stella Blackstone; ISBN 1846860555

Circles, Triangles and Squares, by Tana Hoban; ISBN 0027448304

Circus Shapes, by Stuart J. Murphy; ISBN 0064467139

Round Is A Mooncake: A Book of Shapes, by Roseanne Thong; ISBN 978-0439318327

Cubes, Cones, Cylinders, & Spheres, by Tana Hoban; ISBN 978-0688153250

Captain Invincible and the Space Shapes, by Stuart Murphy; ISBN 978-0064467315

Web sites

National Council of Teachers of Mathematics; http//:www.nctm.org.

National Library of Virtual Manipulatives; http://www.mattimath.com

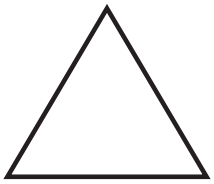
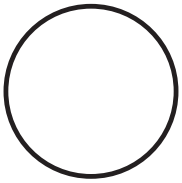
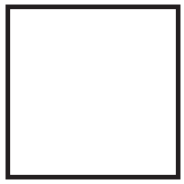
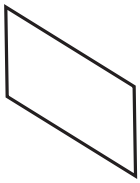
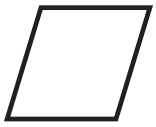
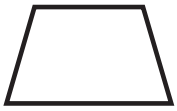
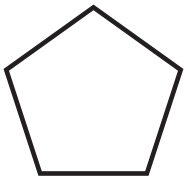
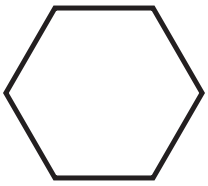
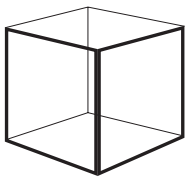
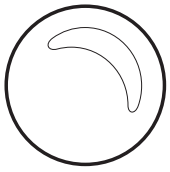
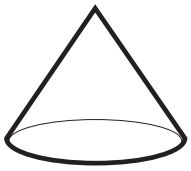
Shape Definition Cards

A triangle has 3 sides. The sides are not always the same. It has 3 angles and 3 vertices.	A circle has 0 sides. It has 0 angles and 0 vertices. A circle is round.	A square has 4 sides. The sides are equal. It has 4 angles and 4 vertices.
A rhombus has 4 sides. The sides are the same. It has 4 angles and 4 vertices. The angles are not the same.	A rectangle has 4 sides. Two sides are parallel with each other and are the same length. The other sides are parallel with each other and are the same length. It has 4 angles and 4 vertices.	A parallelogram has 4 sides. It has 2 pairs of parallel sides. It has 4 angles and 4 vertices.
A trapezoid has 4 sides. It has 2 parallel sides. The sides are not the same. It has 4 angles and 4 vertices.	A pentagon has 5 sides. The sides are equal. It has 5 angles and 5 vertices.	A hexagon has 6 sides. The sides are equal. It has 6 angles and 6 vertices.
A cube is a three-dimensional shape. It has 6 faces. It has 8 vertices. It has 12 edges.	A sphere is a three-dimensional shape. It is round.	A cone is a three-dimensional shape. It is a round shape that is pointed at one end.

Shape Word Cards

triangle	circle	square
rhombus	rectangle	parallelogram
trapezoid	pentagon	hexagon
cube	sphere	cone

Shape Picture Cards

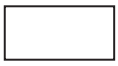
Bingo Card

Name _____

Shape Walk

Circle 

Square 

Rectangle 

Triangle 

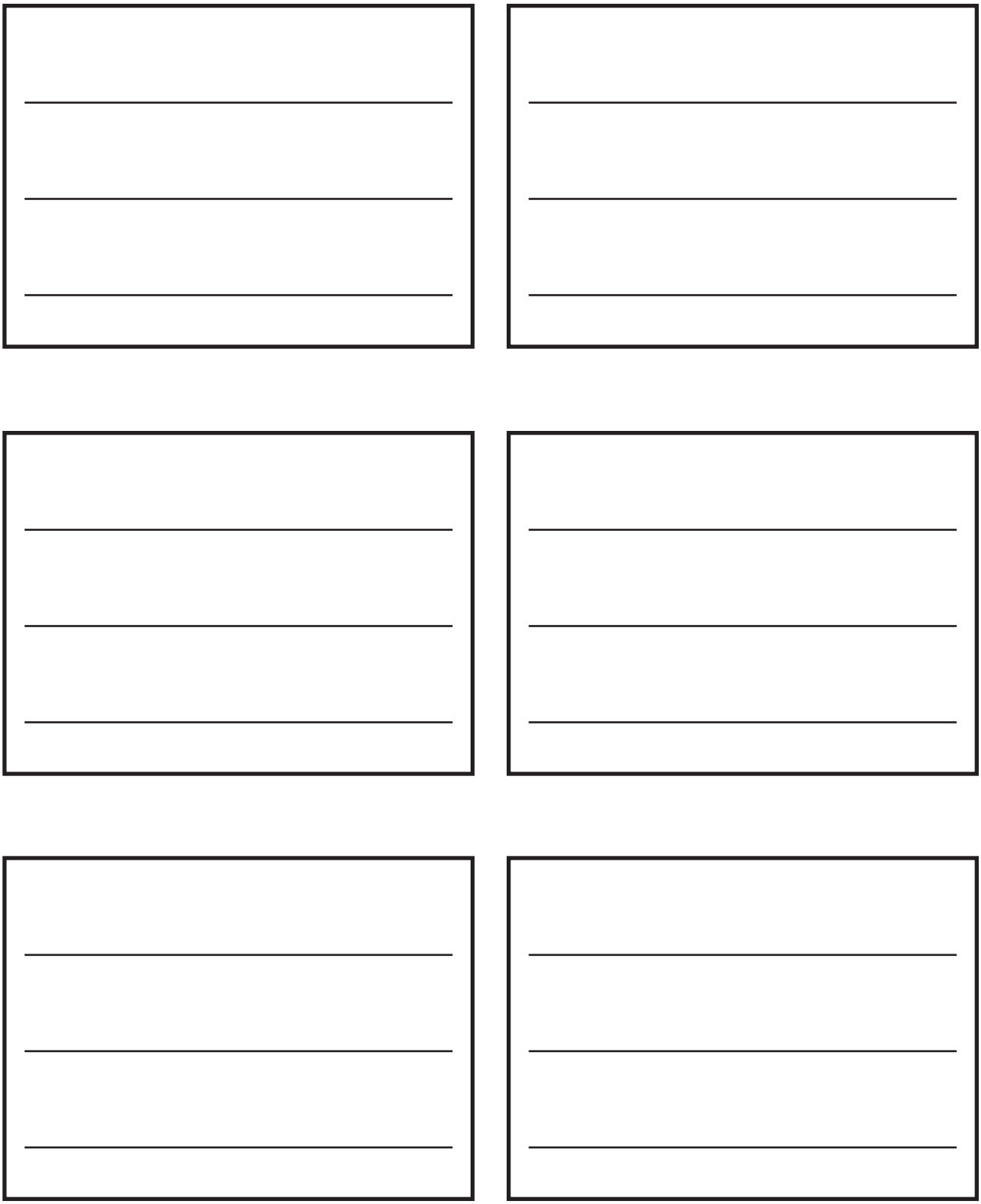
Trapezoid 

Hexagon 

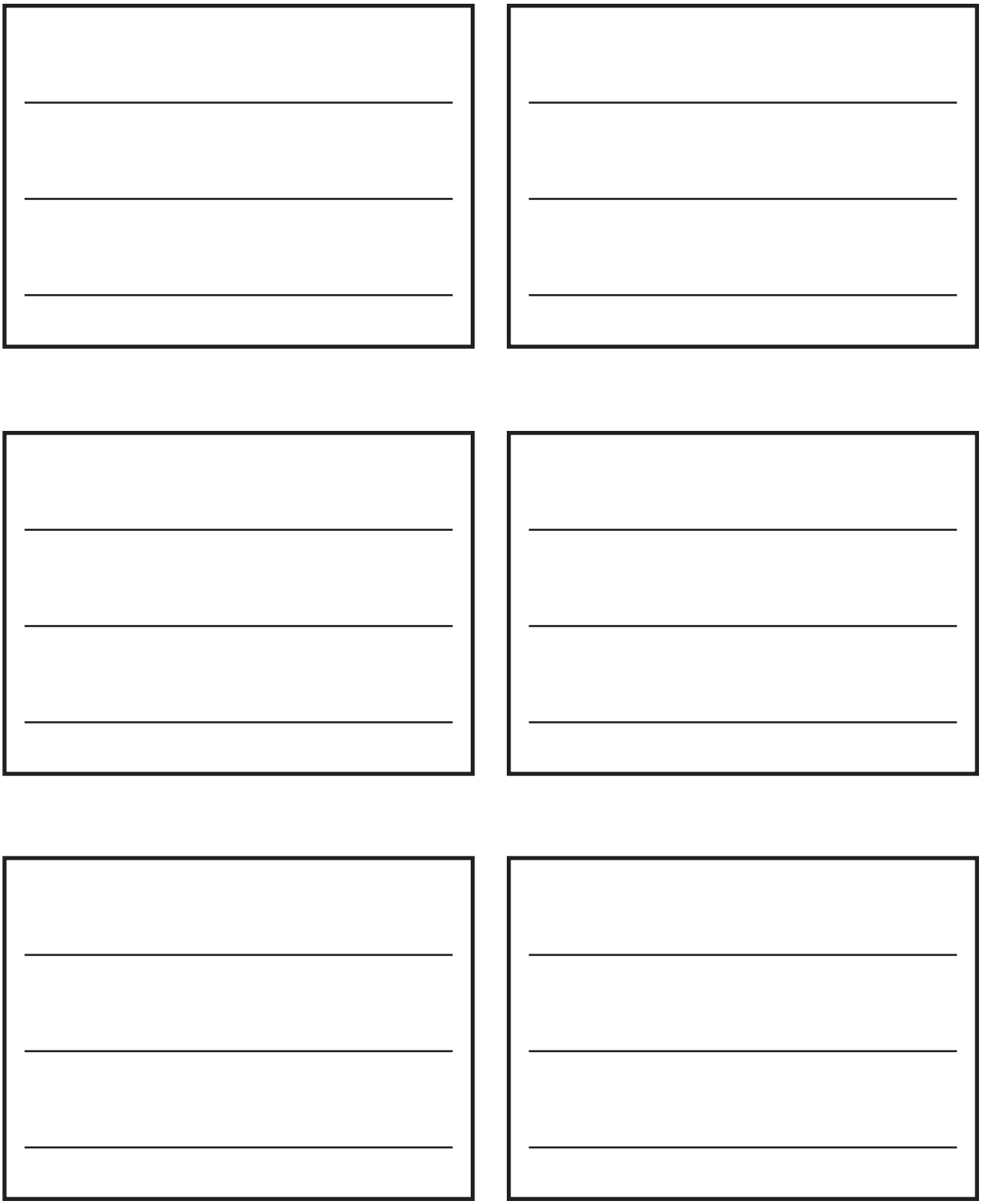
Cube 

Sphere 

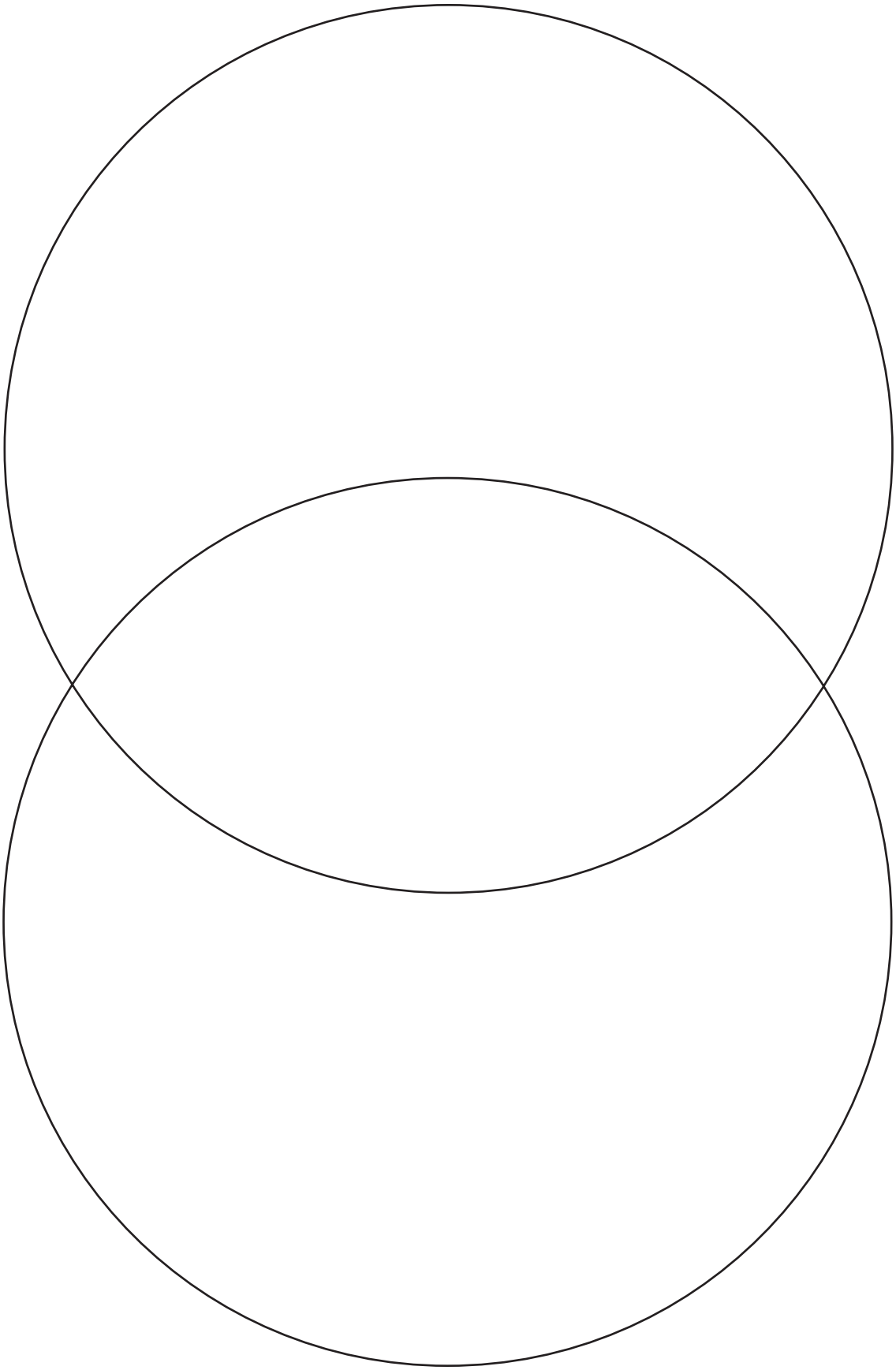
Picture Dictionary



Picture Dictionary continued



Venn Diagram

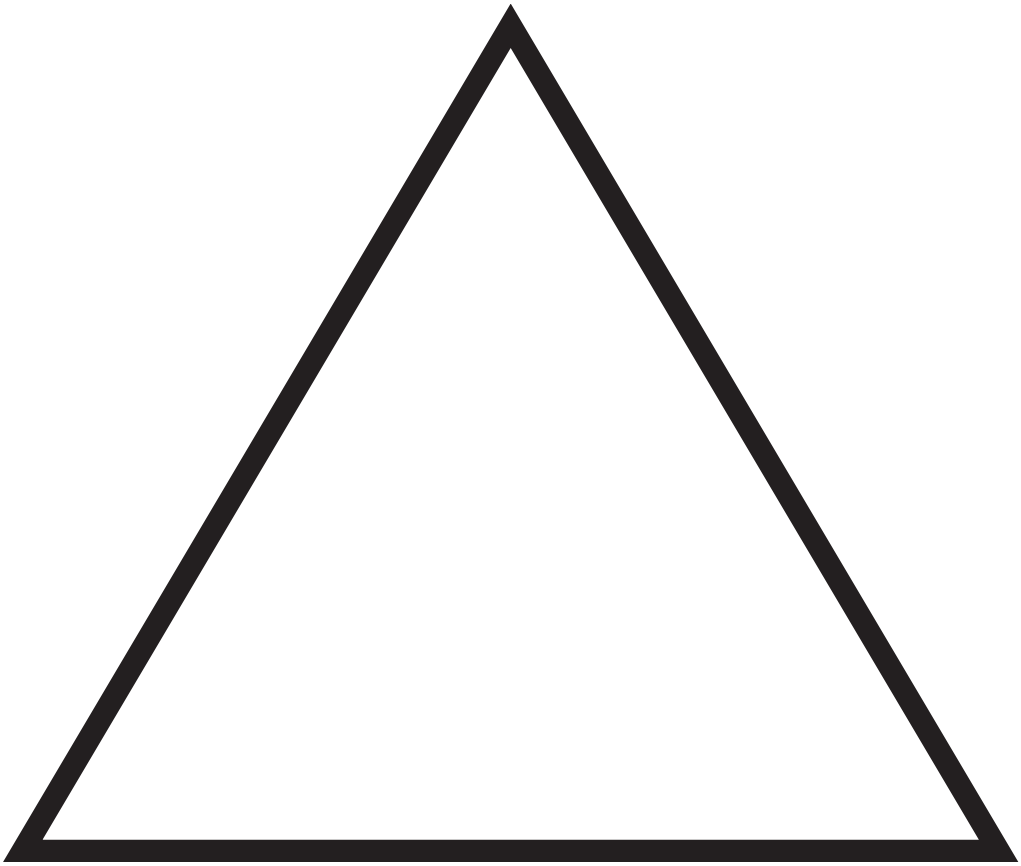


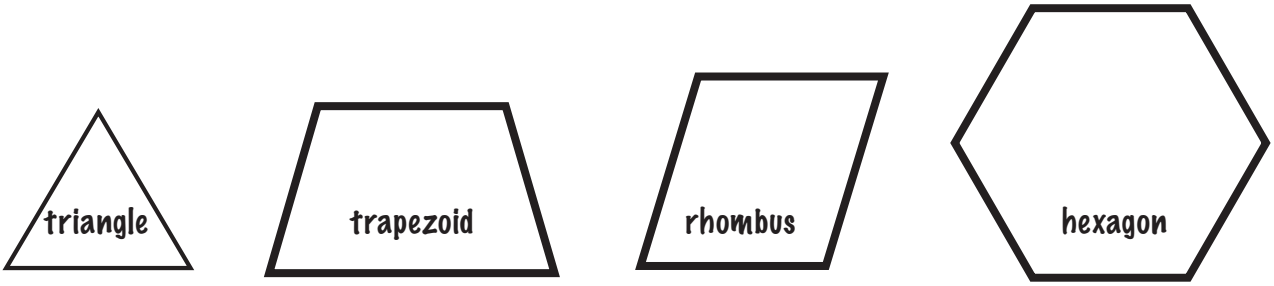
Mathematical Team

Word	Definition
Picture	Example

Name _____

Triangle Cover-up

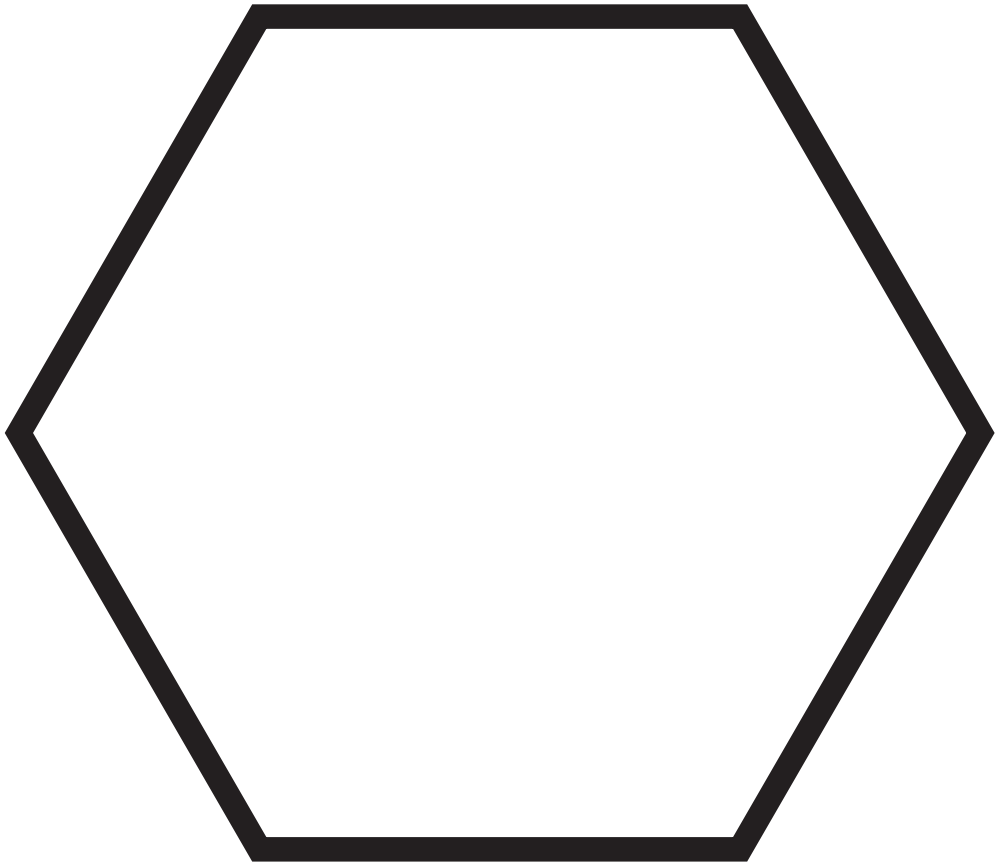


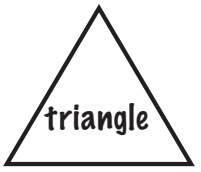


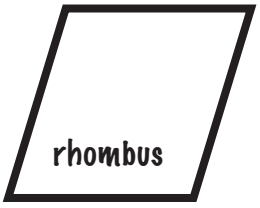
1st Try				
2nd Try				

Name _____

Hexagon Cover-up







1st Try				
2nd Try				

Shape Detective Clue Cards

1. I am a shape. I have 3 sides. I have 3 angles and 3 vertices. What am I?	2. I have no angles. I have no faces. I am round. What am I?
3. I am a shape. I have straight sides. I have 4 sides and 4 angles. Two of my sides are not as long as the others. What am I?	4. I am a shape. I have no sides, angles, or vertices. I am round. What am I?
5. I am a three-dimensional shape. I have 8 vertices and 6 sides. Each of my sides are exactly the same. What am I?	6. I am a shape. I have 4 equal sides. I have 4 angles and 4 vertices. What am I?
7. I am a three-dimensional shape. I have a circle at one end and a point at the other end. What am I?	8. I am a shape. I have 6 equal sides. I have 6 angles and 6 vertices. What am I?
9. I am a shape. I have 4 sides. I have 2 parallel sides. The sides are not the same. It has 4 angles and 4 vertices. What am I?	10. I am a shape. I have 5 equal sides. I have 5 angles and 5 vertices. What am I?

Name _____

Shape Detectives

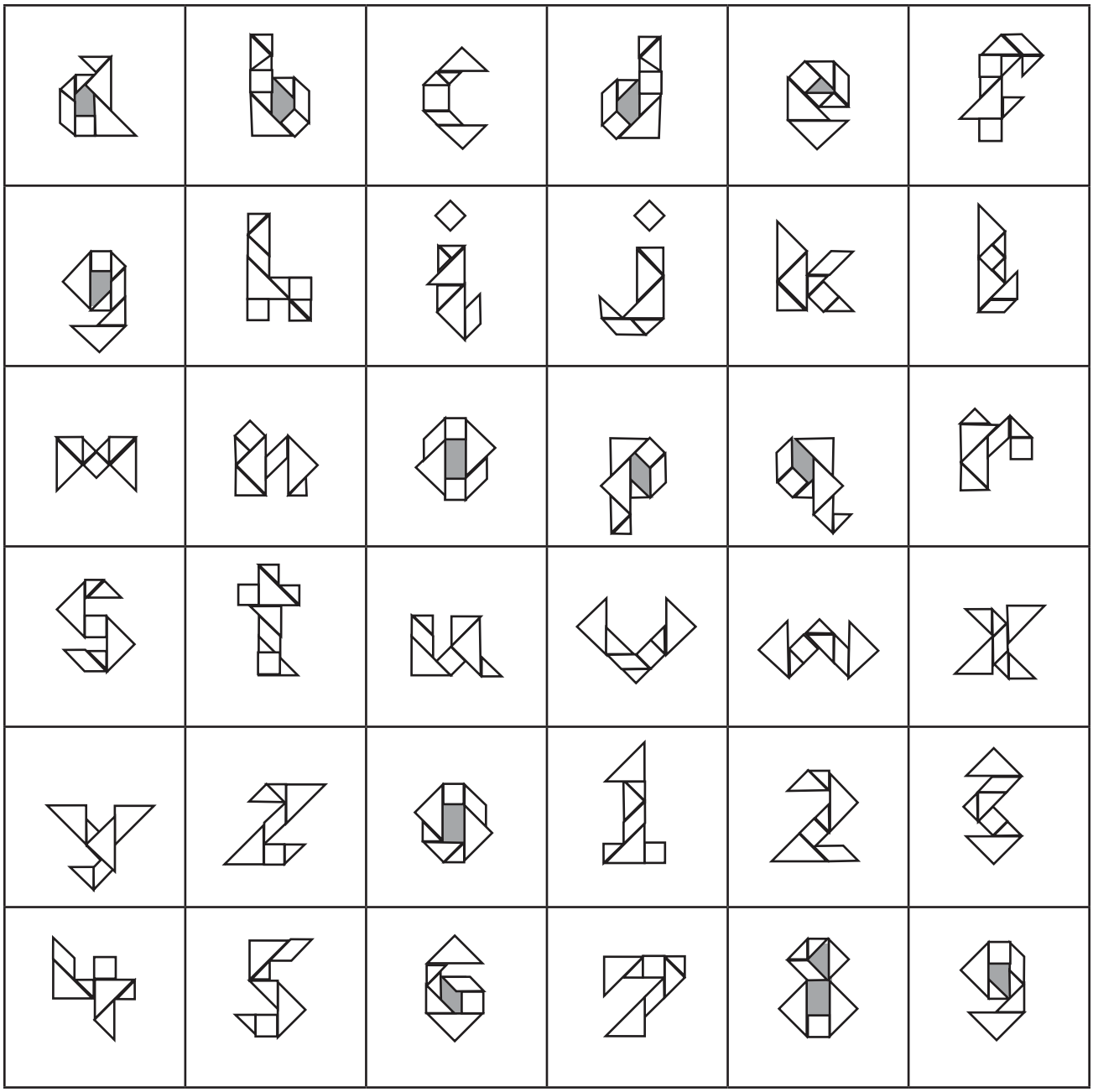
Card 1		Card 6	
Card 2		Card 7	
Card 3		Card 8	
Card 4		Card 9	
Card 5		Card 10	

Name _____

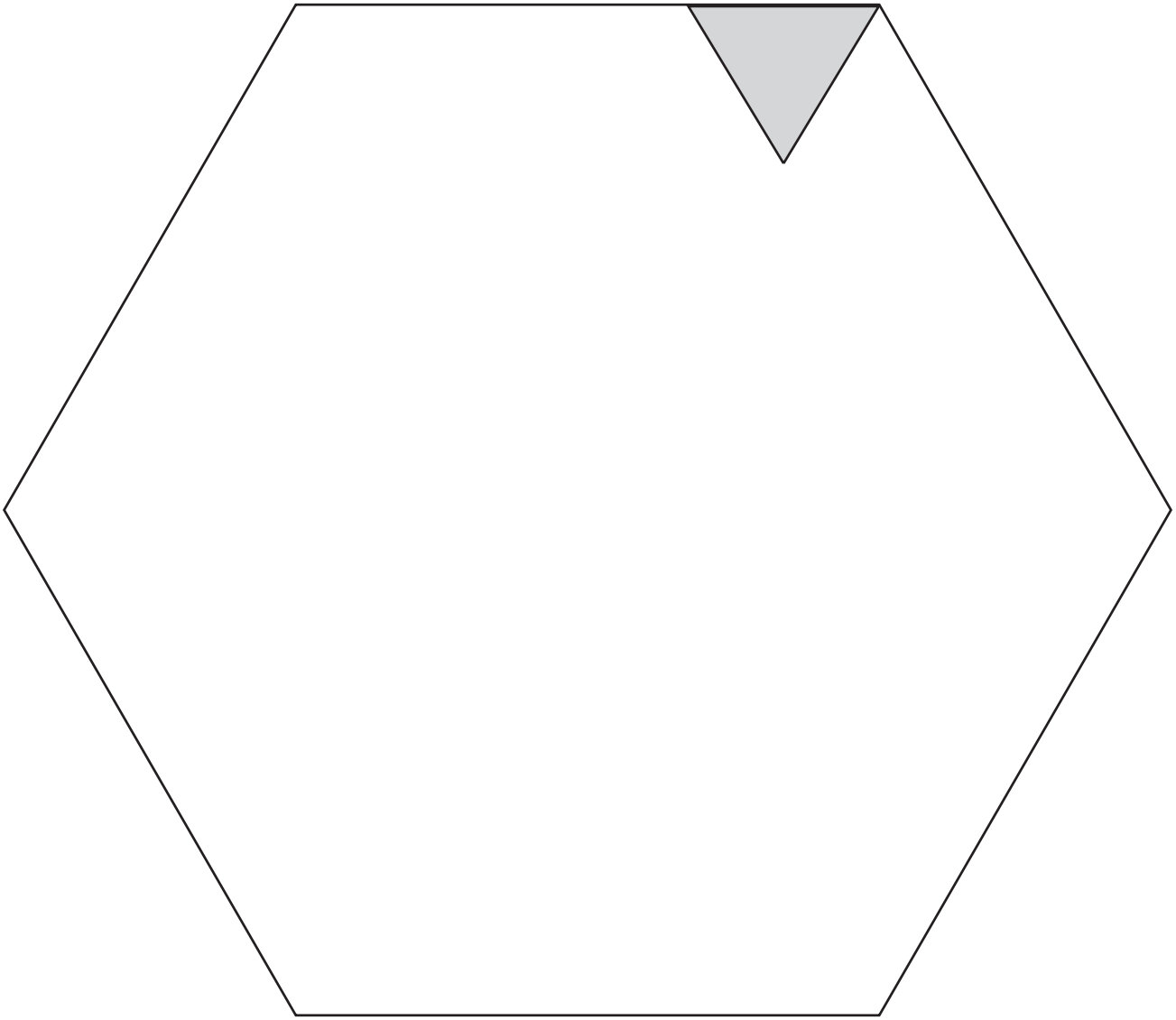
Shape Detectives

Card 1		Card 6	
Card 2		Card 7	
Card 3		Card 8	
Card 4		Card 9	
Card 5		Card 10	

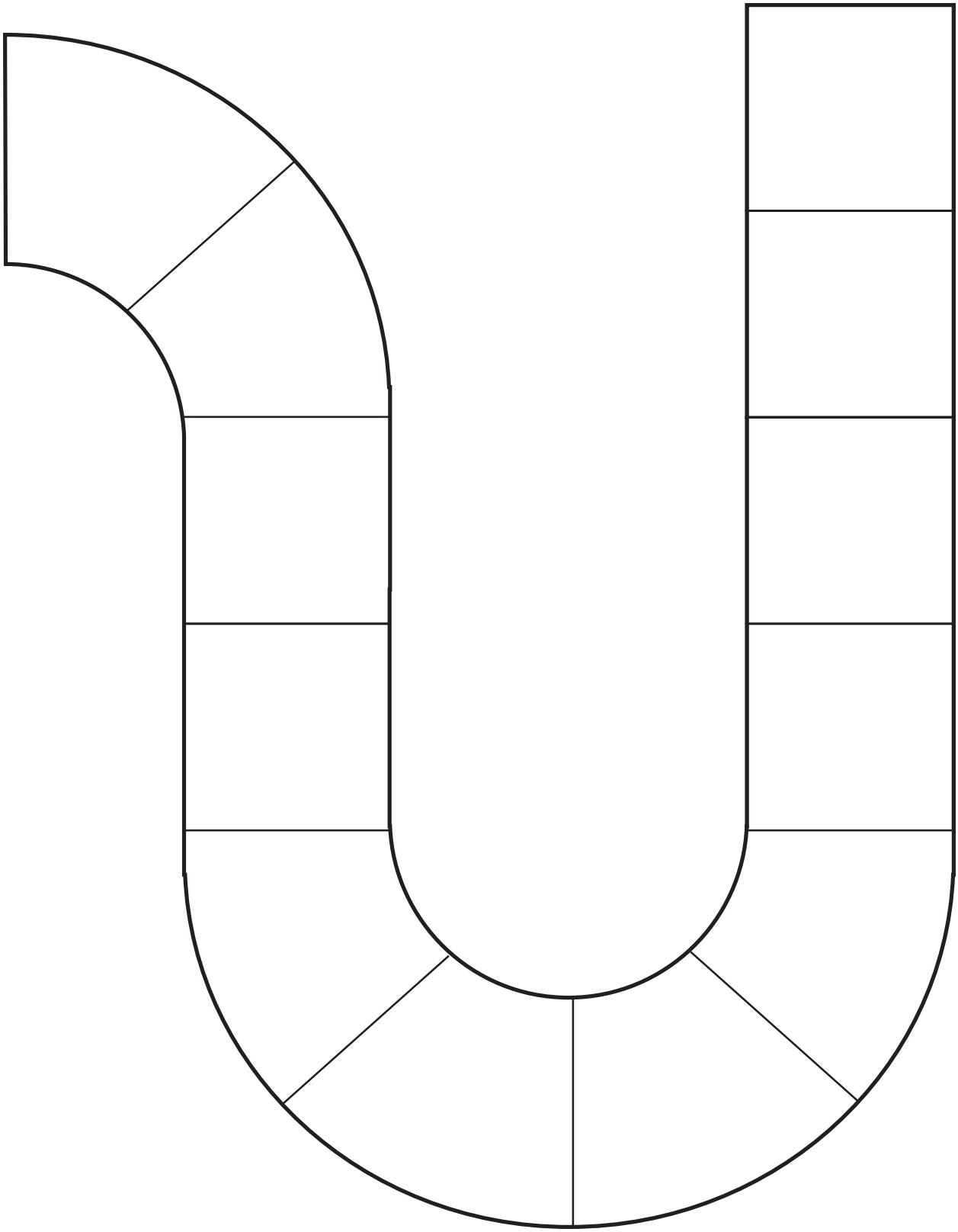
Tangram Chart



Last Block



Blank Game Board



Math III-2

Activities

Measurement

Inchworm Measurement

Standard III:

Students will understand simple geometry and measurement concepts as well as collect, represent, and draw conclusions from data.

Objective 2:

Identify and use units of measure, iterate (repeat) that unit, and compare the number of iterations being measured.

Intended Learning Outcomes:

1. Demonstrate a positive learning attitude.
2. Develop social skills and ethical responsibility

Math Standard III

Objective 2

Connections

Background Information

Students will understand the attribute of length, develop a process of measuring, understand concepts related to units of measure, use estimating to measure, and learn how to use these processes in everyday life. This lesson also allows the teacher to integrate literature into the mathematics curriculum.

Research Basis

Battista, M. (1994). Teacher Beliefs and the Reform Movement in Mathematics Education. *Phi Delta Kappan.*75(6) 462-470.

Recent efforts to make the mathematics curriculum consistent with the National Council of Teachers of Mathematics "Standards" will fail unless teachers' beliefs about mathematics change. Teacher educators, school officials, political leaders, and teachers themselves must first acknowledge a serious problem with the way our society views mathematics. The next step is reforming the institutions affecting teachers' education and working environment.

McClain, K., Cobb, P., Gravemeijer, K., and Estes, B. (1999). Developing Mathematical Reasoning Within the Context of Measurement. In Stiff, V. and Curcio, R. (Eds.) *Developing Mathematical Reasoning in Grades K-12, 1999 Yearbook.* (93-106). Reston, VA; National Council of Teachers of Mathematics.

This paper describes how one group of students developed personally meaningful ways to reason mathematically within the context of measurement. Episodes taken from a first grade classroom in which a 4-month teaching experiment was conducted are presented. One of the goals of the teaching experiment was to develop instructional sequences designed to support first grade students' construction of meaningful understandings for measurement and mental computation and estimation strategies for numbers up to 100.

A primary focus when developing the instructional sequences was to support students' multiple interpretations of problem situations. The episodes provide a setting for the examination of measurement as a context for supporting students' construction of sophisticated ways to think and reason mathematically. The intent of the instructional sequences developed in the course of the teaching experiment is outlined first. The rest of the paper consists of descriptions of episodes from the classroom that highlight students' ability to reason mathematically while investigating issues related to measurement.

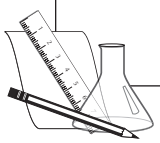
Invitation to Learn

Ask students to estimate about how many books tall they are. (Students could use their Math Journals to measure with.) Have some students share their approximations and then verify the results. Discuss with the students that what they just did was use a nonstandard unit of measurement to measure the length of their bodies. Following the investigation, briefly review what it means to measure the length of an object. Explain to the students that today they will be measuring objects in a different way, as opposed to using a ruler.

Instructional Procedures

Materials

- ❑ *Inchworm Measurement*
- ❑ Inchworm/Centibug rulers
- ❑ *Inch by Inch*
- ❑ Math Journals



1. Read the story *Inch by Inch* to the class. Ask the students:
   - Why would the inchworm be able to measure different birds?
   - How does he measure?
   - What do you think the inchworm will do when the nightingale asks the worm to measure her song?
   - Can you measure a song?
   - How can you measure a song?
2. Explain to the students that they are going to measure just like the inchworm did. They need to choose a partner, or you may set this up ahead of time. Once they are with their partner, they need to get the tools they need to complete this activity. They will need an inchworm ruler for both students and one copy of the *Inchworm Measurement* blackline.
3. Explain to the students that each team will find 10 objects in the classroom. They will estimate the length of each item, and then use their inchworms to measure each item. They will need to record their data on the *Inchworm Measurement* blackline.

Assessment Suggestions

- Observe students' participation in class discussions and during the inchworm activity.
- As a class, have each group share their favorite recorded measurement for an object they found in the classroom. Record each object's name and its measurement on the board/or on a chart.
- Compare the measurements the students recorded.
- Collect the students' worksheets to check for reasonable estimates and measurements.
- Math Journal – Have students record 5 items they could measure using inches and 5 items they would not choose to measure by inches.

Curriculum Extensions/Adaptations/ Integration

- Advanced learners could use night crawlers in addition to their inchworms. Night crawlers could be equivalent to a foot. They could then repeat the activity using both night crawlers and inchworm measurements.
- Repeat this activity using centimeters and meters.
- By working in pairs, students who do not understand or have other special needs can still participate and have a successful learning experience.

Family Connections

- Have students take an *Inchworm Measurement* blackline home and measure 10 items there. Instruct them to bring the information back to school.
- Compare the items that the students measured in their homes. Find the smallest measurement as well as the largest measurement that was presented.

Additional Resources

Books

Inch by Inch, by Leo Lionni; ISBN 0688132839

How Big is a Foot?, by Rolf Myller; ISBN 044040495-9

Twelve Snails to One Lizard: A Tale of Mischief & Measurement, by Susan Hightower; ISBN-10:0689804520 or ISBN-13:9780439154307

Counting on Frank, by Rod Clement; ISBN-10:039570393X or ISBN-13:978-0395703939

Measuring Penny, by Loreen Leedy; ISBN-10:0805065725 or ISBN-13:978-0805065725

Web sites

http://www.etacuisenaire.com/catalog/product?deptId=&prodId=89642&q=inchworm (ETA/Cuisenaire Products – Inchworm Manipulatives)

http://www. educationstationteachers.com (Mavalus Measuring Tape - Flexible, reusable, sticky measuring tape. Black print on yellow tape. 30 - 12" desktapes/roll. 1"X360" – Catalog #MAV10016)

Name _____

Inchworm Measurement

Classroom Object	Estimate of Length	Actual Length

Flip the Beans

Math Standard III

Objective 2

Standard III:

Students will understand simple geometry and measurement concepts as well as collect, represent, and draw conclusions from data.

Objective 2:

Students will identify and use units of measure, iterate (repeat) that unit, and compare the number of iterations being measured.

Intended Learning Outcomes:

1. Demonstrate a positive learning attitude.
2. Develop social skills and ethical responsibility.

Connections

Background Information

Students will use beans and/or bean bags to practice their estimation and measurement skills. They will be able to measure distances to the nearest inch or foot.

Review the following vocabulary with students:

Length – a measured distance of an object

Distance – amount of separation between two points

Estimate – a guess or judgment based on observations.

Research Basis

Battista, M. (1994). Teacher Beliefs and the Reform Movement in Mathematics Education. *Phi Delta Kappan*. 75(6) 462-470.

Recent efforts to make the mathematics curriculum consistent with the National Council of Teachers of Mathematics "Standards" will fail unless teachers' beliefs about mathematics change. Teacher educators, school officials, political leaders, and teachers themselves must first acknowledge a serious problem with the way our society views mathematics. The next step is reforming the institutions affecting teachers' education and working environment.

McClain, K., Cobb, P., Gravemeijer, K., and Estes, B. (1999). Developing Mathematical Reasoning Within the Context of Measurement. In Stiff, V. and Curcio, R. (Eds.) *Developing Mathematical Reasoning in Grades K-12, 1999 Yearbook.* (93-106). Reston, VA: National Council of Teachers of Mathematics.

This paper describes how one group of students developed personally meaningful ways to reason mathematically within the context of measurement. Episodes taken from a first grade classroom in which a 4-month teaching experiment was conducted are presented. One of the goals of the teaching experiment was to develop

instructional sequences designed to support first grade students' construction of meaningful understandings for measurement and mental computation and estimation strategies for numbers up to 100. A primary focus when developing the instructional sequences was to support students' multiple interpretations of problem situations. The episodes provide a setting for the examination of measurement as a context for supporting students' construction of sophisticated ways to think and reason mathematically. The intent of the instructional sequences developed in the course of the teaching experiment is outlined first. The rest of the paper consists of descriptions of episodes from the classroom that highlight students' ability to reason mathematically while investigating issues related to measurement.

Invitation to Learn

Have each student select a Ziploc bag from a basket. Each bag should contain approximately $1.50-$2.00 in coins as well as a small item. [Example: a paper clip, a birthday candle, a tongue depressor, etc.] Ask the students to measure the height of their desk from the floor to the top of their desk using the item inside their bag. They must now pay $0.05 for each measurement length if they want to use their desk for the remainder of the class period. Have students trade items with other students and measure using the various nonstandard items. Students will recognize that the smaller the unit, the more iterations needed to cover a given length. Have students record their findings in their Math Journals. Review with students that sometimes we use nonstandard units of measurement.

Materials

- ❏ *Bean Flip*
- ❏ Measurement items
- ❏ *Jim and the Beanstalk*
- ❏ Math Journals
- ❏ Plastic bean counters
- ❏ 12 inch rulers
- ❏ Ziploc bak of coins
- ❏ Small items: paper clips, birthday candles, tongue depressors, etc.

Instructional Procedures

Read *Jim and the Beanstalk* to the class. Discuss how Jim measures the different body parts and items in the book. Refer to the proportions of what is being measured and what unit of measurement is used.

1. Hand each child a bean counter.
2. Explain to students that they will be flipping a bean at their desks. They will be recording estimates as well as actual measurements.
3. Demonstrate how to flip a bean across a desktop without it leaving that space. The beans must stay on the desktop for this activity.

4. Hand out the *Bean Flip* recording sheets and explain how to record the data. Review with your students the length of an inch before you ask them to make their estimates.
5. Students will complete 10 trials with their beans. Students should flip their bean, make an observation and record their estimate as to how far the bean traveled on their desk. Then students will use a ruler to measure the actual distance and record it on their sheets. Students can see how close their estimates were by finding the difference between the two measurements.
6. See Group Activity under Curriculum Extensions

Assessment Suggestions

- Ask students to move their bean about ____ inches to see if they comprehend how long one inch is.
- Collect students' recording sheets to determine if students have used appropriate units of measurement.
- Have students record in their Math Journal five different items with their measurement recorded in beans as well as inches.

Curriculum Extensions/Adaptations/ Integration

- Group Activity: After students have completed 10 trials with the beans, the class can work together in the gym, outside, or in an open classroom tossing a bean bag. This will give the students an opportunity to estimate and measure longer distances. It can be done in relay fashion with a starting point and an ending point. Each team should be equipped with a bean bag, clipboard, pencil, recording sheet, and a standard unit of measurement (yardstick/measuring tape). At the signal, each team gently tosses the beanbag underhand. Students should make an observation, record an estimate, and then work together to measure the actual distance. The first group that gets from start to finish with the closest measurement to the correct answer would win that round.
- By making relay teams, students who do not understand or have other special needs can still participate and have a successful learning experience.
- Students can plant bean seeds. Using a ruler they can record in their Math Journals the plants' growth pattern.

Family Connections

- Have students take home a dried bean and a recording sheet. They could challenge members of their family to flick the bean only a certain distance, making sure to measure and record the data.
- Encourage students to teach the relay game to their families and play it at home.

Additional Resources

Books

Jim and the Beanstalk, by Raymond Briggs; ISBN-13:9780698115774

Web sites

ETA/Cuisenaire Products – Bean Counters

http://www.etacuisenaire.com/catalog

Name _____

Bean Flip

Directions: Flip the bean carefully across the top of your desk. Estimate how far it traveled. Take an actual measurement using a ruler or measuring tape. Record the difference.

Trial	Estimate	Actual	Difference
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

Capacity Challenge

Standard III:

Students will understand simple geometry and measurement concepts as well as collect, represent, and draw conclusions from data.

Objective 2:

Identify and use units of measure, iterate (repeat) that unit, and compare the number of iterations to the item being measured.

Intended Learning Outcomes:

1. Demonstrate a positive learning attitude.
2. Develop social skills and ethical responsibility.

Math Standard III

Objective 2

Connections

Background Information

Volume and capacity are the measurements used to describe the inside of a container. The definition of volume is the measurement of space occupied by anything. The definition of capacity is the amount a container holds. An object such as a rock or a brick has volume but no capacity. People began measuring volume, as they did with mass and weight, using natural objects like eggshells. The problem was that eggshells could differ in size. It became necessary for people to develop a standard unit of measurement.

The Babylonians were the first to develop a standard unit for measuring capacity. They used a hollow cube with specific linear measurements filled with water. This gave them the first unit of capacity. Today, a cube filled with water is still used as a standard unit of capacity.

Research Basis

Rommel-Esham, K., (October, 2007). How Much Popcorn Will Our Classroom Hold? *Science and Children* 45(2) 22-26.

How much popcorn will our classroom hold? This intriguing question sparked a terrific integrated science and math exploration conducted with fifth and sixth-grade students. In the process of finding the classroom's volume, students developed science-process skills (e.g., developing a plan, measurement, collecting and interpreting data, prediction, inference, communication, and using number relationships) and applied mathematical processes (determining an estimate, using benchmarks, measuring, mapping, etc.) in a meaningful way-getting an authentic glimpse of how these two subjects are inextricably linked.

Downey, J.A., Cobbs, G.A., (January 2007). "I Actually Learned A Lot from This": A Field Assignment to Prepare Future Preservice Math Teachers for Culturally Diverse Classrooms. *School Science and Mathematics* 107(1) 391-403.

Teacher education programs are cognizant of the need to prepare preservice teachers (PTs) to work effectively with children from diverse cultural backgrounds. Well-constructed field experiences can help PTs develop awareness and gain understanding of important cultural considerations related to effective teaching and learning (Sleeter, 2001). This paper describes a unique field assignment created for an Elementary Math Methods course in which 61 PTs were trained to conduct a semi-structured interview with a student whose cultural background was different than their own. PTs transcribed their own interviews and completed a guided reflection on their experiences. Reflections were submitted and analyzed for emerging themes. Analyses suggest that the structured interview component of this field assignment provided PTs with increased insight into mathematics instruction and the learning needs of diverse students. It also discusses the value and limitations of this instructional innovation and propose avenues by which to continue to help PTs grow toward becoming culturally relevant pedagogies (Irvine, 2003).

Invitation to Learn

Have the students correct silly sentences. They can record their corrections in their Math Journals.

For example:

*John is very thin. He weighs 60 inches.

*Sarah poured juice for each student. She gave each child a quart.

*Susan walked a long way. She walked 10 centimeters.

*The bug crawled across the desk. It went about 6 miles.

Instructional Procedures

Materials

- ❑ Mini-marshmallows
- ❑ 5 Bottles of different sizes
- ❑ 5 cups of rice
- ❑ *Pigs in the Pantry; Fun with Math and Cooking*
- ❑ Math Journals

Marshmallow Mouth

1. Read *Pigs in the Pantry* to the class. Discuss what happened that made it so difficult for the pigs' recipe to turn out correctly. Discuss how important it is to use accurate measurement when asked to do so.
2. Have several containers at the front of the room that vary in capacity. Try to use bottles that are short and fat, long and slender, as well as bottles that are familiar to the students.

3. Work as a class to order the bottles by capacity. Be sure that the labels are removed so that the students cannot see the capacity listed on the label.
4. Once the bottles have been put in order, fill the bottle that is predicted to hold the largest amount to the top with rice. Use a black marker line to show the full capacity
5. Use the rice from the largest bottle to fill the next largest bottle. Talk with the students to determine if this container is filled to capacity. Repeat with the remaining bottles. Be sure to always use rice from the first/largest bottle. The main point for the students is that if the rice from one container overflows when poured into a new container, the first container has a larger capacity. If the rice does not come to the rim or top of the container then the first container has a smaller capacity.
6. Rearrange the bottles, if necessary, in the correct order from largest to smallest. It is important that the order does change from the original order so that the students understand that looks can be deceiving.
7. Relate to the students that they have just determined the capacity of the bottles. Use the correct terms throughout the lesson so that the students become familiar with their meanings.
8. Group the students into pairs. Have each student estimate how many mini-marshmallows it will take to fill their own mouth to capacity. Students will keep their teeth clenched and fill their mouths between their teeth and cheeks to avoid any possible choking hazards. Students will record this observation in their Math Journals. Partners should also estimate each other's mouth capacity by looking into their partners open mouth. Record this observation as well.
9. When all estimates are done, pass out a generous handful of mini-marshmallows to each team. Tell them that their mouths are filled when their lips can still close over the marshmallows. There is no eating until all of the work is done. Have students begin filling their mouths with the marshmallows. One student fills his/her mouth while their partner counts and records the data.
10. Make a large chart that shows each child's name and the capacity of marshmallows his/her mouth can contain. Compare largest to smallest, equal to, not equal to, etc.

Materials

- ❑ Quart milk cartons
- ❑ Containers
  - Cup
  - Pint
  - Quart
  - Gallon
- ❑ Rice
- ❑ Measurement containers
- ❑ Measurement "cups"
- ❑ *Crazy Cups*

Instructional Procedures

Crazy Cups

1. Place the following containers at the front of the room. Have the containers labeled:

   1 gallon, 1 quart, 1 pint, 1 cup.
2. Discuss where they have seen these objects before.
3. Review the need for a standard from of measurement.
4. Using the rice, show several examples of the relationships between the different containers.
5. Have the students break into small groups. Each group should have 5 containers that can be filled with rice using a 1 cup measure.
6. Have them estimate how many cups they would find in each container. Record it on the *Crazy Cups* blackline.
7. Using rice, have students measure the correct amount into each container. Record their findings on their *Crazy Cups* blackline.

Assessment

- Use the class graph as a discussion/assessment tool. Review what capacity means.
- Discuss how various containers may have capacities larger or smaller than expected.
- Show students a 1 cup container. Have students list 5 other containers that would have less than 1 cup capacity. Record estimates in their Math Journal.

Curriculum Extensions/Adaptations/ Integration

- Have students bring in containers that they think hold 1 cup. Break into teams and explore.
- By pairing up, students who do not understand or have other special needs can still participate and have a successful learning experience.

Family Connections

- Have students choose 4 bottles or containers at home and have them determine the capacity of these bottles from greatest to least. Have them record data and return it to school.
- Have students help cook something for dinner with their parents. Request that the recipe calls for measurement using cups. Have the student report to the class about their experience.
- Compare written estimates in children's Math Journals for reasonable estimates and measurements.

Additional Resources

Books

Pigs in the Pantry; Fun with Math and Cooking, by Amy Axelrod; ISBN 0-689-80665-5

Name _____

Crazy Cups

Item	Estimate in cups	Actual cups
1.		
2.		
3.		
4.		
5.		

Content III-3

Activities

Rocks

All Sorts of Rocks

Standard III:
Students will develop an understanding of their environment.

Objective 3:
Investigate the properties and uses of rocks.

Intended Learning Outcomes:
1. Demonstrate a positive learning attitude.
5. Understand and use basic concepts and skills.

Content Connections:
Language I-2; Present information
Language VIII-6; Create list
Language VI-1; Learn new words

Content Standard III

Objective 3

Connections

Background Information

Children are excited to learn about rocks, especially when the learning is hands-on! Take this opportunity to have students collect and bring in rocks. The lessons will be more engaging if the students have been responsible for collecting the rocks.

In this lesson, students access their prior knowledge of sorting with a card sort and a book before being asked to apply their understanding of sorting to rocks. This will help the students prepare to think critically and remind them that there are many different ways to sort the same set of objects.

To be successful, the students will need to understand the concepts of hardness, texture, layering, and particle size as they relate to rocks. The literature shared in this lesson, and the rock adjective game will both help to facilitate this understanding.

Research Basis

Hänze, M., & Berger, R. (2007). Cooperative learning, motivational effects, and student characteristics: An experimental study comparing cooperative learning and direct instruction in 12th grade physics classes. *Learning and Instruction*. 17(1), 29-41.

Researchers compared student achievement in classrooms with cooperative learning instruction and traditional direct instruction. The method of instruction was found to interact with student's self-concept; students with low academic self-concept profited more from cooperative learning instruction than from direct instruction because they experienced a feeling of greater competency.

Mintz. E. & Calhoun, J. (2004). Project Notebook: Science notebooks emerge. *Science and Children*. 42(3), 30-34.

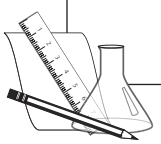
Teachers from South Carolina, attempting to meet the needs of their diverse student population, create a program implementing science notebooks. They believed that science could be used as a vehicle for increasing student achievement across the curriculum. Science notebooks, used in conjunction with an inquiry-based science curriculum, emerged as the natural vehicle for helping to create an effective science program.

Invitation to Learn

The teacher gives each student or team of students a deck of cards. Students are invited to sort their cards. Once finished they are asked to share with the class how they have sorted their cards. The teacher emphasizes that there are many different ways to sort the cards correctly.

Materials

- ❑ Deck of cards
- ❑ *Dave's Down-to-Earth Rock Shop*
- ❑ A box of rocks
- ❑ Hand lenses
- ❑ *Time Capsule Form*
- ❑ *Rock Sorting Challenge*
- ❑ Time Capsule
- ❑ *Rock Bingo*
- ❑ Bingo game pieces



Instructional Procedures

1. Ask students to share what they know about time capsules. Discuss how time capsules are usually buried and left alone for many, many years to show how much things have changed over time, but that with your special time capsule you can see how much things have changed over minutes instead of years. On their time capsule form have each student list as many ways as they can think of to sort rocks. Have the students place their lists in the time capsule.
2. Read Dave's Down-to-Earth Rock Shop to the class.
3. Encourage students to make text-to-text, text-to-self, and text-to-world connections.
4. Give each group of students a box of rocks and some hand lenses. Ask the students to examine the rocks closely and work together as a group to compile a list of adjectives, that describe their rocks.
5. Discuss group results and compile a class list on the board. Use this opportunity to reinforce vocabulary and concepts such as hardness, texture, particle size, and layering.
6. Have the students fill in the *Bingo* blackline master with the adjectives on the board.
7. Play *Bingo* with their cards and the terms in your class list. As each adjective is called out ask the students to review the

rocks on their desk and hold up any that are described by the adjective.

8. As a class, discuss the different ways that rocks were sorted in the book *Dave's Down-to-Earth Rock Shop*. Invite the students to work in groups to find different ways to sort the rocks on their table.
9. Circulate among the groups to informally assess their understanding.
10. Hand out a *Rock Sorting Challenge* to each group and ask them to discuss how they will sort their rocks and what materials they will need to organize their sort. Meet with each group to scaffold and facilitate their plans.
11. Have each group read their *Rock Sorting Challenge* to the class and show their rock collection.
12. Display their collections in the classroom.
13. Have each student create a new list of all the ways they can think of to sort rocks on the *Time Capsule form*.
14. Open your time capsule and have the students compare their old and new lists to see how many new ways of sorting they have come up with.

Assessment Suggestions

- Informally assess their responses to the Bingo game and their ability to match adjectives with their rocks.
- Assess the rock collections created by the class groups and their verbal explanations to the class.
- Review student responses on their final *Time Capsule form*.
- Invite students to create and sort a rock collection at home and present it to the class.

Curriculum Extensions/Adaptations/ Integration

- Invite students to select a rock. Ask them to measure and record as much information about their rock as they can. Have them imagine that a rich man has offered to give them $1000 if they can find their exact rock in a field of rocks using the information that they record.

- Take two samples of granite and tap both with a hammer to demonstrate how strong they are. Take one sample and repeatedly bake and plunge in ice water. This speeds up the erosion process that naturally occurs during the winter and summer seasons. After ten cycles of freezing and thawing tap the sample again with the hammer. The sample will crumble into its three component pieces. Invite students to sort the particles by color.
- Advanced learners can be introduced to Moh's Scale of Hardness and given the appropriate tools for determining rock hardness more accurately.
- Rock Field Guides may be introduced to advanced learners.
- Review academic language using pictures and other appropriate graphic organizers for ESL students.

Family Connections

- Invite the students to collect appropriately sized rocks at home to use for the sort. This needs to be done up to a week before beginning the lesson.
- Encourage families to go rock hunting and sort their rocks by color, hardness, texture, layering or particle size. Invite them to share and display their collections in your classroom.

Additional Resources

Books

Dave's Down-to-Earth Rock Shop, by Stuart J. Murphy; ISBN 0064467295

Let's Go Rock Collecting, by Roma Gans; ISBN 0064451704

Rocks and Minerals, by DK Publishing; ISBN 0789497604

Smithsonian Handbooks: Rocks & Minerals, by Chris Pellant; ISBN 0789491060

Web sites

http://kids.si.edu/collecting/

http://rocksforkids.com/

http://www.fi.edu/tfi/units/rocks/rocks.html

Name _____

Time Capsule

Date _____ Time _____

List all of the ways that you can think of to sort rocks.

Rock Sorting Challenge

Sort your rocks by **COLOR**
Sort your rocks by **HARDNESS**
Sort your rocks by **TEXTURE**
Sort your rocks by **PARTICLE SIZE**
Sort your rocks by **LAYERING**

Rock Bingo

		FREE		

Mystery Rocks

Content Standard III

Objective 3

Connections

Standard III:

Students will develop an understanding of their environment.

Objective 3:

Investigate the properties and uses of rocks.

Intended Learning Outcomes:

1. Demonstrate a positive learning attitude.
5. Understand and use basic concepts and skills.

Content Connections:

Language I-1; Develop language
Content I-3; Expression through art
Content II-3; Art of different cultures

Background Information

This lesson is designed to get students thinking about the uses of rocks in the world around them. Special focus needs to be placed on 'why' the rock would be suitable for use. It is important that students learn that soft rocks would be unsuitable for buildings or arrowheads, and that hard rocks would be a poor choice for a chalk substitute or for creating a petroglyph.

There are some obvious opportunities to teach more about the culture of the Native Americans at the end of this lesson. There are also opportunities to discuss how we can respect rock art and other ancient artifacts in our state.

The term 'petroglyph' will need to be introduced to most students. It describes art that is carved, scratched, or pecked into rock. It is not interchangeable with the term 'pictograph,' which describes art that is painted onto rock.

The plaster of Paris used in this lesson can be easily and inexpensively obtained from a hardware store in the paint and spackle area. It is a rock product that is similar in composition to limestone. The plaster of Paris powder is mixed with water and sets up within an hour. The plaster can be poured into paper plates, Styrofoam meat trays, or a shallow cookie sheet. If the plaster of paris pieces are painted a dark earth tone, the picture the students etch will be more visible.

Research Basis

Hänze, M., & Berger, R. (2007). Cooperative learning, motivational effects, and student characteristics: An experimental study comparing cooperative learning and direct instruction in 12th grade physics classes. *Learning and Instruction*. 17(1), 29-41.

Researchers compared student achievement in classrooms with cooperative learning instruction and traditional direct instruction. The method of instruction was found to interact with student's self-concept; students with low academic self-concept profited more from cooperative learning instruction than from direct instruction because they experienced a feeling of greater competency.

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Teachers from South Carolina attempting to meet the needs of their diverse student population, create a program implementing science notebooks. They believed that science could be used as a vehicle for increasing student achievement across the curriculum. Science notebooks, used in conjunction with an inquiry-based science curriculum, emerged as the natural vehicle for helping to create an effective science program.

Invitation to Learn

Show pictures or examples of rocks, one at a time, and encourage student responses about how the rock could be used. Show pictures or examples of how the rock was used. Discuss why that rock was a good choice for that use (for example: granite is a good choice for countertops because it polishes smooth and is very hard).

Instructional Procedures

1. Invite the class to view the contents of one of the Mystery Rock boxes (not the plaster of Paris piece). Ask them to write at least a paragraph on their half piece of paper describing how they think it is used, and why it would be used that way. Encourage them to use their creativity and write so well that the other students will be convinced that they are right.
2. Ask the students to share their writings and discuss the possibilities.
3. Share with them the true identity of the rock and its uses.
4. Collect the students' writing and staple it inside the halves of the *Mystery Rock* blackline master to make a book.

Materials

- ❑ Pictures of rocks
- ❑ Five Mystery Rock Boxes
- ❑ Ancient rock art
- ❑ Pieces of plaster of paris
- ❑ Nails
- ❑ *Mystery Rock*
- ❑ *Rock Opportunities*
- ❑ Writing paper

5. Display the four other *Mystery Rock* boxes, and half pages of writing paper in a center. Encourage the students to examine the other mystery rocks and write what they believe each rock is used for.
6. Compile the students work to make books for each mystery box.
7. As a class, review the student guesses and their reasoning. Uncover the real uses of each rock and discuss why the characteristics of that rock make it good for its use.
8. Unveil the plaster of Paris pieces last and discuss how similar rock was used for thousands of years to record history and tell stories.
9. Show pictures of ancient rock art and discuss what can be learned from the pictures (e.g. how they hunted, what they wore, what animals they lived with, etc).
10. Distribute plaster of Paris pieces and nails so that students can create their own petroglyph. Encourage students to tell a story or capture a memory with their picture and to think ahead since it is difficult to fix mistakes.

Assessment Suggestions

- Assess the student responses to the Mystery Rock boxes. They should be able to explain what characteristics of each rock make it suitable for their suggested use.
- Their artwork should show that they understand that rock art was used to preserve stories or memories.

Curriculum Extensions/Adaptations/ Integration

- A field trip to collect rocks, fossils, or to view rock art would be useful to reinforce the lesson.
- An unpainted piece of plaster or Paris can be placed in a shallow bowl of vinegar. Bubbles will form, and over time, it will completely disintegrate. This is a good example of what happens to limestone buildings that are subjected to acid rain for a very long time. Daily observations should be made and can be recorded in a science journal.
- Dissolve as much rock salt as possible in very hot water. Hang a string into the center of the salt water. Leave, and allow salt

crystals to develop. You can experiment to determine what conditions (light/dark, hot/cold) encourage the best crystal growth. Student observations can be recorded daily in a science journal.

- Review academic language using pictures and other appropriate graphic organizers for ESL students.

Family Connections

- Send home Mystery Boxes and encourage families to discuss what they think each rock could be used for.
- Using the *Rock Opportunities* blackline master, create a list of nearby areas to collect rocks, find fossils, view rock art, etc. Send it home with the students and encourage their families to take a field trip together!

Additional Resources

Books

Easy Field Guide to Rock Art Symbols of the Southwest, by Rick Harris; ISBN 0935810587

How We Use Rock, by Chris Oxlade; ISBN 1410909964

Looking at Rocks, by Jennifer Dussling; ISBN 0448425165

Native American Rock Art: Messages from the Past, by Yvette Lapierre; ISBN 1565660641

Rock Art of Utah, by Polly Schaafsma; ISBN 0874804353

Web sites

http://www.rocksandminerals.com/uses/htm

http://www.usgs.gov/

http://www.moab-utah.com/anasazi/rockart.html

http://cldphoto.com/rock.html

Organizations

Utah Rock Art Research Association, P.O. Box 511324, Salt Lake City, UT 84151-1324, www.utahrockart.com

Mystery Rock

Mystery Box #1

The mystery rock in this box could be used for...

This mystery rock is really SALT!

Geologists call it Halite.
It is used to season our food.
This rock dissolves in water.
This rock melts ice.

Mystery Rock

Mystery Box #2

The mystery rock in this box could be used for...

This mystery rock is really SAND!

Sand is melted to make glass.
It is used as an ingredient in concrete and stucco.
When it is glued to paper it makes sandpaper.

Mystery Rock

Mystery Box #3

The mystery rock in this box could be used for...

This mystery rock is really GRANITE!

It is a very hard rock.
It is polished and used for countertops.
It can also be used in buildings, statues, and headstones.

Mystery Rock

Mystery Box #4

The mystery rock in this box could be used for...

This mystery rock is really PUMICE!

This rock can float.
It is an ingredient in pink rubber erasers. It is ground up and used to make nail files and household cleaners.

Mystery Rock

Mystery Box #5

The mystery rock in this box could be used for...

This mystery rock is really LIMESTONE!

Statues and buildings are made out of this rock. Soft limestone is used as chalk. Limestone is made out of broken-up and packed-down seashells.

Rock Opportunities

Second graders are naturally curious about the world around them. And here in Utah, we are surrounded by opportunities to learn more about rocks, fossils, and ancient rock art. Consider visiting some of these areas with your students to learn more:

Content II-3

Activities

Forms of Expression

The Cinderella Projects

Standard II:
Students will develop a sense of self in relation to families and community.

Objective 3:
Express relationships in a variety of ways.

Intended Learning Outcomes:
3. Demonstrate responsible emotional and cognitive behaviors.
6. Communicate clearly in oral, artistic, written, and nonverbal form.

Content Connections:
Content I-3; Communicating ideas

Content Standard II

Objective 3

Connections

Background Information

Students should have some knowledge of Disney's *Cinderella*. This is the most common and most kids are familiar with this version. Students need basic knowledge of painting, sculpting, and creating art with cutting or tearing paper. Students should be familiar with depth (perspective) in works of art.

Research Basis

Holcomb, S. (2007) State of the Arts. ***neatoday***. 34-37

This article focuses on the benefits of integrating arts across the curriculum. The arts create a "natural bridge that can transfer over to math, history, and science." Focusing on the arts in the curriculum helps students to think creatively and can help students retain knowledge from other curricula areas.

Rabkin, N. & Redmond, R. (2006). The Arts Make a Difference. ***Educational Leadership***. 60-64

Arts education effects student achievement, especially in the lowest socioeconomic status. Arts-integrated programs were associated with academic gains which were seen in standardized test scores, some scores rose as much as two times faster than those in traditional schools. The studies also showed a decrease in students acting out and being disruptive.

Sousa, D. (2006). How the Arts Develop the Young Brain. ***School Administrator***. 63(11) 26-31

Integrating arts across the curriculum increases cognitive activity; the arts engage many parts of the brain and help with learning. Arts integration has positive effects on students. Students learn in different ways; the arts act as a bridge to help learning in other areas. The arts

help students relate to others and provide challenges for students that are already successful.

Invitation to Learn

Review with students the characters from Disney's *Cinderella* (Cinderella, Stepmother, Stepsisters, Fairy Godmother, Prince and Mice). They will be making a graph on the board of their favorite and least favorite characters. On the board, write the names of the characters at the bottom and give each student two different colored sticky notes (pink and yellow), have them put their pink sticky note on the board above the character from Disney's *Cinderella* that is their favorite, or that they relate the most to. The yellow sticky note goes above the character that is their least favorite. In their journals, have them write about why those particular choices were their most and least favorite. For example, "I like the mice because they help Cinderella."

Instructional Procedures

Materials

- ❑ *The Rough-Face Girl*
- ❑ *Comparison Chart*
- ❑ Art supplies
- ❑ Cinderella stories
- ❑ *Rubric for Grading Art*

Part One – Cinderella Art

(These activities to be done over a period of 5 days or more.)

1. Gather the students onto the carpet.
2. Ask students to tell you about the Disney version of *Cinderella*. (If necessary, use a Disney version picture book and do a picture walk to go over some of the details.)
3. Explain that there are many versions of Cinderella from many different cultures and over the next few days you are going to be reading and comparing the stories.
4. Read *The Rough-Face Girl*.
5. Ask students to rate what they thought of the story. (Fist to 5: keeping their hand on their chest so only the teacher can see, have them hold their hand in a fist if they did not like the story at all, 3 fingers out if it was OK, or 5 fingers out if they liked the story. You could also let them use any numbers in between to show the degree of their like or dislike for the book.)
6. Have the students go back to their seats, and hand out the *Comparison Chart*.
7. Make an overhead of the comparison chart. Fill out the *Comparison Chart* on the overhead as the students fill out their paper.

8. Start out by having the students describe the Cinderella character from *The Rough-Face Girl*. If the Rough-Face Girl and Cinderella have something in common, it goes in the oval in the middle. If it is something that is specific to the Rough-Face Girl, it goes in the parallelogram. If it is something that is specific to Disney's *Cinderella*, it goes in the trapezoid.
9. As they are comparing the two, make sure that each idea is put in the proper place on the *Comparison Chart*. For example, if they are comparing Cinderella with the Rough-Face Girl, and they say they both wear rags, "rags" would fit in the "clothing" area.
10. Once the *Comparison Chart* is filled out for all of the character and story elements, re-visit the illustrations in *The Rough-Face Girl*.
11. Ask the students to look closely at the pictures, and ask what they notice in the illustrations that show this story comes from a Native American culture. (Moccasins, teepees, buckskin clothes, paintings on the teepee, etc.)
12. Have students list what they noticed in the "Specific Cultural Aspects" rectangle at the bottom of the *Comparison Chart*.
13. Repeat with three more Cinderella stories representing three different cultures (see additional resources). Reiterate the differences between the various stories and cultures they represent. This is a great opportunity for you to look at your classroom, see what types of cultures are represented, and choose a story from those cultures.
14. After reading and comparing stories, students will create their own work of art choosing a scene from one of the multicultural versions of *Cinderella*. Students may use any type of art medium available to them such as, watercolor, crayon, marker, diorama, torn paper, etc.
15. Share with students the *Art Rubric* so they know what is expected to be part of their artwork.
16. Encourage students to take their time to really think about the elements they will put in their piece. Also remind them about depth (perspective). Objects closer to them will appear large; objects farther away will appear smaller.
17. Remind them about the illustrations and the things they noticed which made that story specific to a culture. They need to try and re-create those items in their piece of art.
18. Have students sketch out their idea in their journal before they begin creating their piece of art.

Materials

- ❑ Colored index cards
- ❑ Scarves
- ❑ Other student-made props
- ❑ *Theatre Rubric*
- ❑ *Student Participation Survey*
- ❑ *Teacher Participation Survey*

Part Two – Cinderella Theatre

1. Choose several Cinderella stories and write the names of the characters on the index cards or construction paper. If a character does not have a name, identify on the card the story from which the character origianates. (Make sure you have at least one character for each student.) Each set of characters should be on one color, for example, all of the characters from *The Rough-Face Girl* are on blue paper, all the characters from *Mufaro's Beautiful Daughters* are on green paper, etc.
2. Place the index cards on the board. Have students choose a character from the board and then sit down.
3. In their journals, have each student use the graphic organizer "inside out" to write down information about their character. (Draw one large oval that fills up your paper, draw a small oval in the center of your large oval.) On the inside oval, they write their character's name. In the outside oval, they need to write important information about their character. They can answer the questions: Why does your character act the way he/she does? What kind of relationship does he/she have with others in the story? What makes her so nice or mean? Why does he/she treat "Cinderella" the way he/she does? Etc.
4. Keeping their journals with them, have each group meet together.
5. In their journals, have student list some of their favorite scenes from their story, providing the appropriate book for each group.
6. As a group, they need to agree on a scene to act out.
7. As a group, have the students talk about their ideas for what they will say and do in the scene, and what might be needed as props.
8. Share with students the *Theatre Rubric,* so they know what is expected of their performance.
9. They need to have one sentence that tells what their character thinks as the scene is beginning for the "freeze" section. For example, in *The Rough-Face Girl*, the stepsister may think "I am so beautiful, I can't sit by the fire like my sister and become scarred, for if I do, the Invisible Being won't want to marry me." Explain that they will be creating a "freeze" scene and will be sharing their sentence with the class before they act out their scene.
10. Students may use any props or create their own for their scene.

11. As students are getting their scene ready, the teacher will walk around and fill out a *Participation Survey* for each group.
12. Before the scene is acted out, students will get into their spots and freeze.
13. The teacher will touch a student in the scene and he/she will "come to life" and tell what he/she is thinking at that moment.
14. Students will act out their scene.
15. After they are finished acting, they will remain at the front for a Q&A in character.
16. The audience may ask any character a question; the actor will need to respond as if he/she was that character.
17. After everyone has had a chance to act their scene, have them fill out the student *Student Participation Survey*.

Assessment Suggestions

- *Comparison Chart*
- *Art Rubric*
- Personal observations
- *Participation Survey*
- *Theatre Rubric*

Curriculum Extensions/Adaptations/ Integration

- This activity readily lends itself to language arts, folk tales and fairy tales.
- If you have a student that has difficulty writing, he/she can tell and talk about what he/she will say and do.
- Have students extend the story. What happened after Cinderella moved out to live with her Prince?
- Have students write their own version of *Cinderella*.
- Students may act or illustrate a "what if" version. "What if the step-sister was nice?" "What if the step-mother loved Cinderella?" "What if Cinderella's parents had never died?"

Family Connections

- Talk to students' families about their own heritage and where they come from. Find a Cinderella story or other fairy tale from their country of origin to bring back and share with the class.
- Students could write their own version of Cinderella with their family and then share with the class.

Additional Resources

Books

Abadeha: The Philippine Cinderella, Adapted by Myrna J. de la Paz (Philippines); ISBN 1-885008-17-1

Angkat: The Cambodian Cinderella, by Jewell Reinhart Coburn (Cambodia); ISBN 1-885008-09-0

Anklet for a Princess, by Lila Mehta (India); ISBN 1-885-00820-1

Cendrillon: A Caribbean Cinderella, by San Souci (Caribbean Islands); ISBN 0-689-80668-X

Chinye: A West African Folk Tale, retold by Obi Onyefulu (Africa); ISBN 0-670-85115-9

Cinderellis and the Glass Hill, by Gail Carson Levine (boy version, chapter book); ISBN 0-06-028336-X

Domitila: A Cinderella Tale from the Mexican Tradition, Adapted by Jewell Reinhart Coburn (Mexico); ISBN 1-885008-13-9

The Egyptian Cinderella, by Shirley Climo (Egypt); ISBN 0-690-04824-6

The Faithful Friend, by Robert D. San Souci (Caribbean Islands); ISBN 0-02-786131-7

The Golden Sandal: A Middle Eastern Cinderella Story, by Rebecca Hickox (Middle East, India); ISBN 0-8234-1513-9

Jouanah: A Hmong Cinderella, Adapted by Jewell Reinhart Coburn with Tzeza Chera Lee (Asian; Thailand, Laos, Vietnam); ISBN 1-885008-01-5

The Korean Cinderella, by Shirley Climo (Korea); ISBN 0-06-020432-X

Mufaro's Beautiful Daughters: An African Tale, by John Steptoe (Africa; Zimbabwe); ISBN 0-663-59261-5

The Persian Cinderella, by Shirley Climo (Persia, now Iran); ISBN 0-06-26765-8

The Rough-Face Girl, by Rafe Martin (Native American); ISBN 0-698-11626-7

Yeh-Shen: A Cinderella Story from China, retold by Ai-Ling Louie (China); ISBN 0-399-20900-X

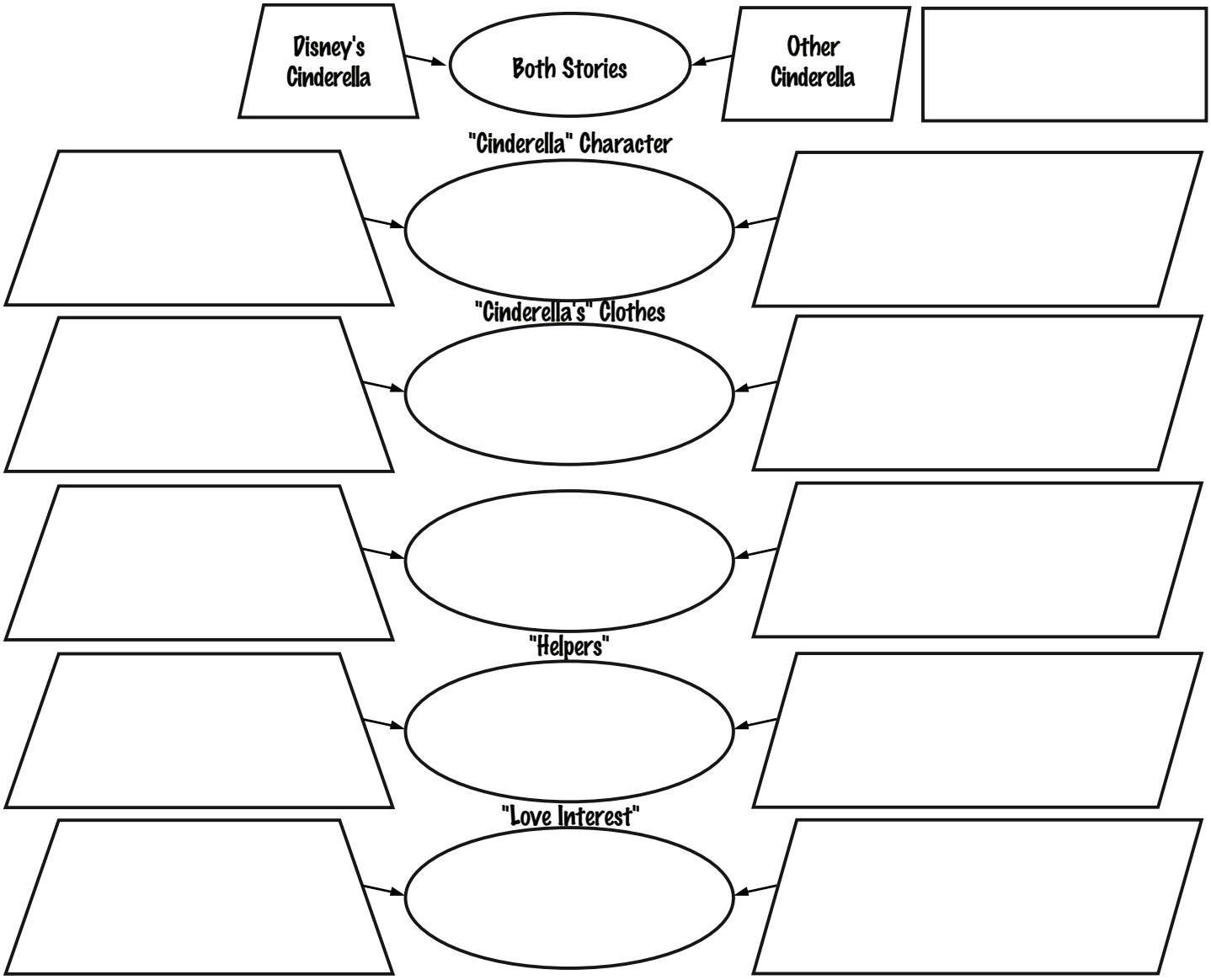
Web sites

http://www.biopoint.com/WebQuests/dist204/particpationr.html

http://www.ala.org/ala/booklinksbucket/multicultural.htm

http://www.surlalunefairytales.com/cinderella/index.html

Comparison Chart



Specific Cultural Aspects:

Art Rubric

4 Exemplary	3 Accomplished	2 Developing	1 Beginning	Score
The artwork clearly depicts a specific cultural *Cinderella* scene.	The artwork has many elements of a specific cultural *Cinderella* scene.	The artwork has a few elements of a specific cultural *Cinderella* scene.	The artwork has no elements of a specific cultural *Cinderella* scene.	
The artwork has a clear idea and you can tell time was spent on details.	The artwork has some ideas and some time was spent on the details.	The artwork has some thought behind it but feels a bit rushed.	The artwork seems to have been rushed with little or no thought behind it.	
The artist used depth (perspective); objects that are close are large.	The artist is using some depth (perspective); most objects that are close are large.	The artist is beginning to use depth (perspective).	There is no depth (perspective) in this piece of art.	

Theatre Rubric

4 Exemplary	3 Accomplished	2 Developing	1 Beginning	Score
The actor uses a loud clear voice all of the time.	The actor uses a loud, clear voice most of the time.	The actor uses a loud, clear voice sometimes.	The actor is quiet and doesn't project his/her voice.	
I can tell the piece is from a specific cultural Cinderella story.	I can tell that most of the scene is from a specific cultural Cinderella story.	I can tell that some of the scene is from a specific cultural Cinderella story.	This scene isn't from a specific cultural Cinderella story.	
The actor put a lot of thought into his/her character and the character's relationships with others.	The actor put some thought into his/her character and the character's relationships with others.	The actor put little thought into his/her character and the character's relationships with others.	The actor put no thought into his/her character and the character's relationships with others.	

Student Participation Survey

	4 Always	3 Almost Always	2 Sometimes	1 Never
Did I do my jobs and was I prepared to meet and work with my group?				
Did I share information with my team that related to our assignment?				
Did I listen to everyone in the group and give everyone a chance to speak?				
Did I cooperate with my group and not argue with them?				

Other comments or concerns:

Teacher Participation Survey

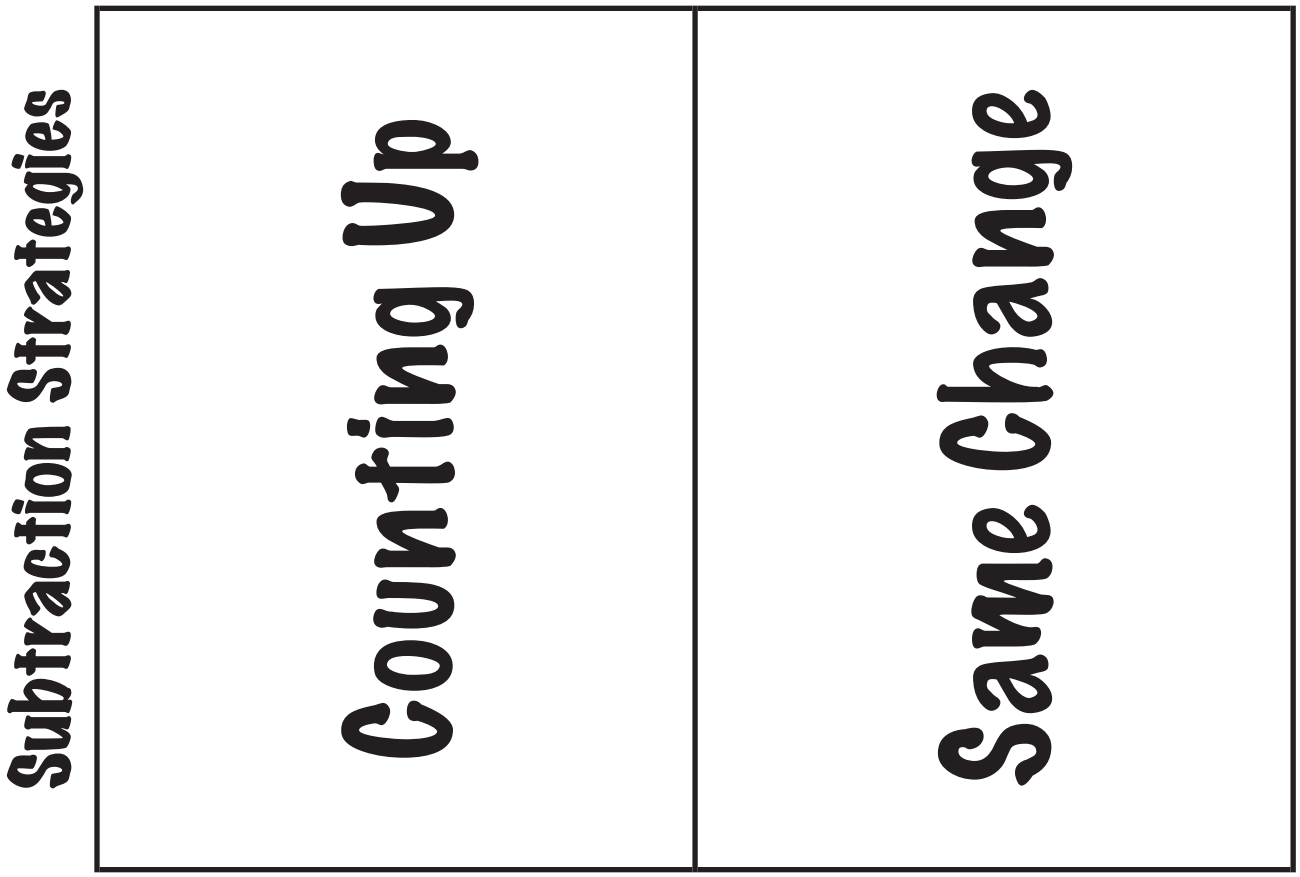
	Beginner 1	Intermediate 2	Advanced 3	Expert 4
Fulfill Team Role	Does not perform any of assigned team duties.	Performs few duties.	Performs nearly all duties.	Performs all of assigned team duties.
Share Information	Does not relay information to teammates.	Relays very little information, some relates to the topic.	Relays some basic information, most relates to the topic.	Relays a great deal of information, all relates to the topic.
Listen to Other Teammates	Is always talking, never allows anyone else to speak.	Usually does most of the talking, rarely allows others to speak.	Listens, but sometimes talks too much.	Listens and speaks a fair amount.
Cooperate with Teammates	Usually argues with teammates.	Sometimes argues.	Rarely argues.	Never argues.

http://www.biopoint.com/WebQuests/dist204/particpationr.html

Appendix

Addition Strategies

Expanded	Partial Sums	Opposite Change


Subtraction Strategies
Counting Up
Same Change

Shopping Spree Place Value Recording Sheet

Name _____

Th	H	T	O

Th	H	T	O

Shopping Spree Place Value Recording Sheet

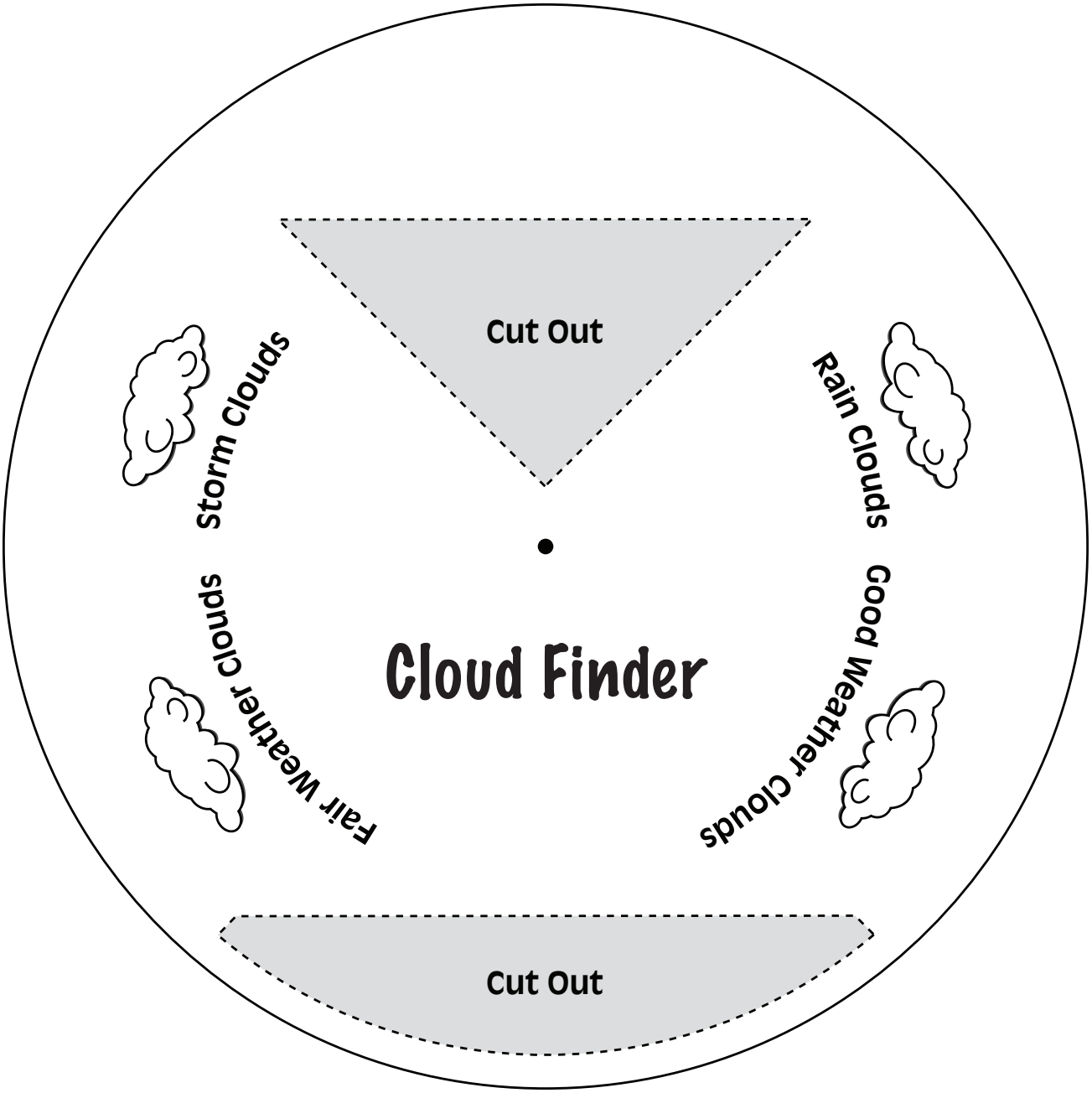
Name _____

Th	H	T	O

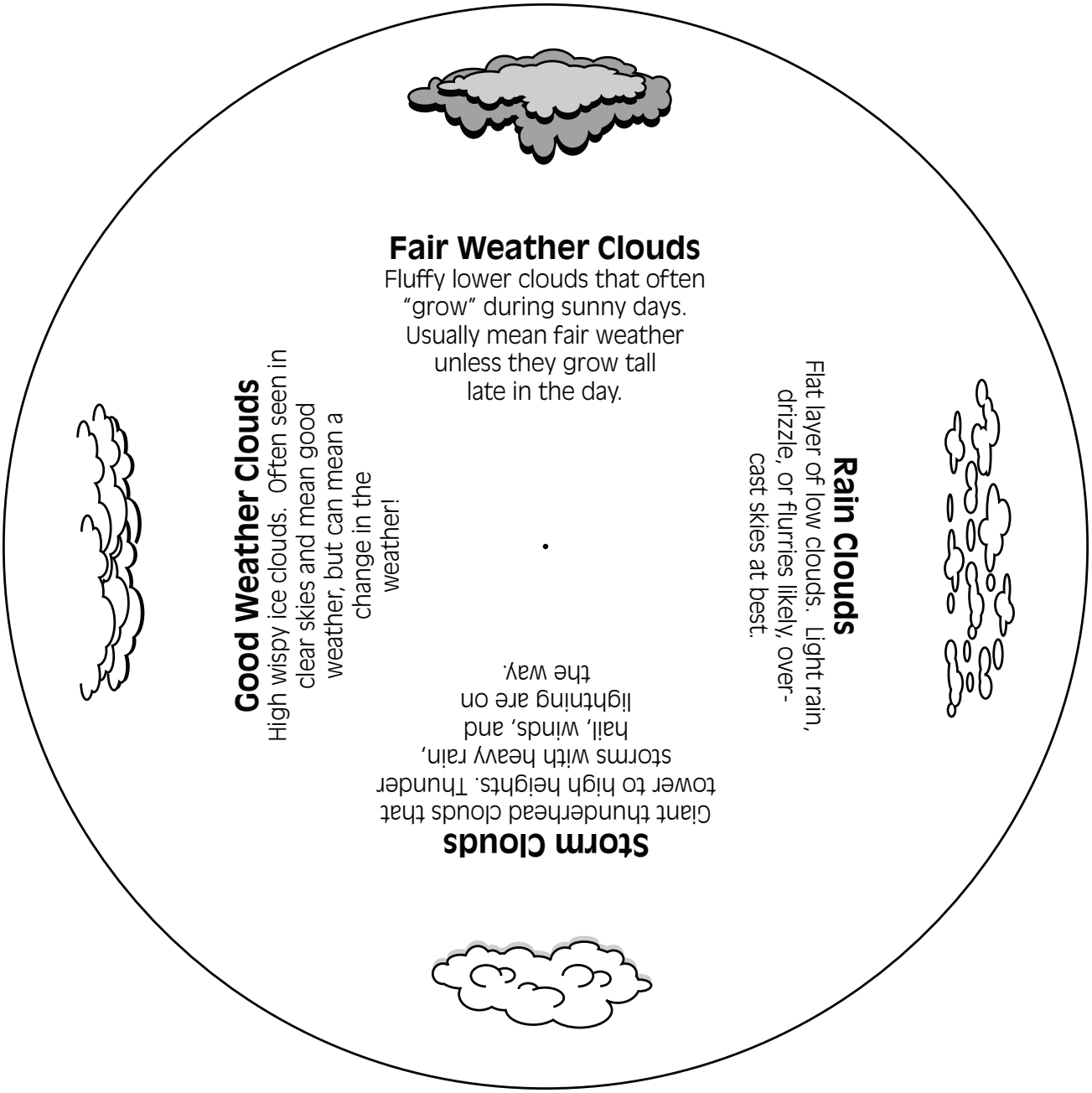
Th	H	T	O

Cloud Key

Cut out the wheel. Cut out the two shaded areas inside the wheel. This is the top wheel of your Cloud Key.



Cloud Key


Fair Weather Clouds
Fluffy lower clouds that often "grow" during sunny days. Usually mean fair weather unless they grow tall late in the day.
Good Weather Clouds
High wispy ice clouds. Often seen in clear skies and mean good weather, but can mean a change in the weather!
Rain Clouds
Flat layer of low clouds. Light rain, drizzle, or flurries likely, overcast skies at best.
Storm Clouds
Giant thunderhead clouds that tower to high heights. Thunder storms with heavy rain, hail, winds, and lightning are on the way.

Drop Estimation Page

1. How many droplets are inside this rain drop?

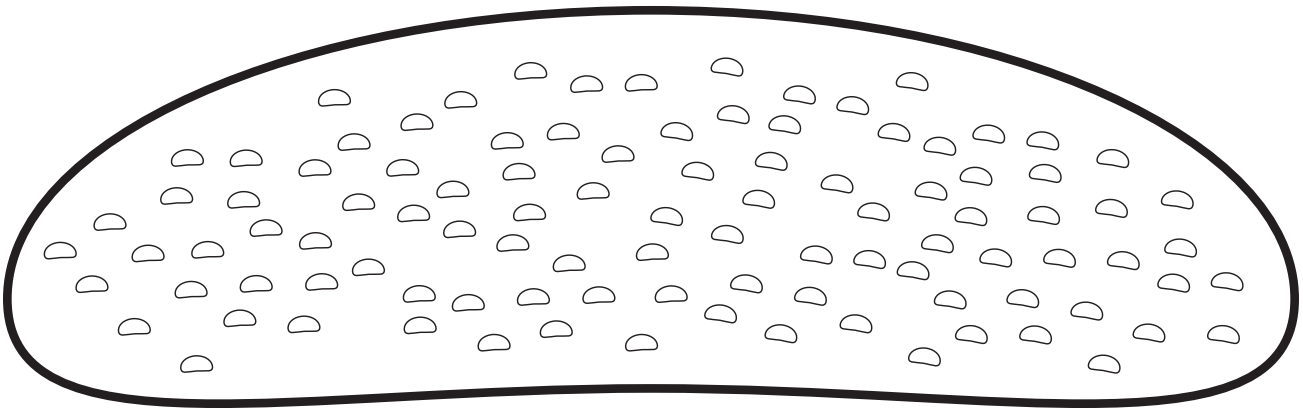
   My estimate _____

2. Circle groups of 10 droplets. Count by tens.

   There are _____ groups of 10 in this rain drop.

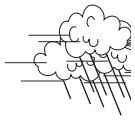
3. How many droplets are inside this rain drop?

   My count _____

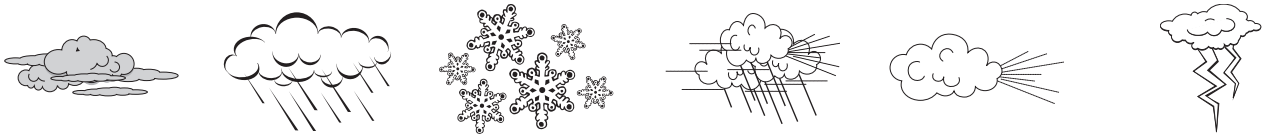


FIND SOMEONE WHO...

Directions: Find someone who has personally experienced the described storm before. Ask him/her to sign his/her name on your paper. You may not repeat any names and you may not use your own name to fill a spot. When finished, bring your paper to your teacher. Good Luck!

1. Find someone who has been in a snow storm before _____ 
2. Find someone who has been in a rain storm before _____ 
3. Find someone who has been in a blizzard before _____ 
4. Find someone who has been in a lightning storm before _____ 
5. Find someone who has been in a wind storm before _____ 
6. Find someone who has been in a tornado before _____ 
7. Find someone who has been in a hurricane before _____ 
8. Find someone who has driven in fog before _____ 
9. Find someone who has been in a hail storm before _____ 
10. Find someone who has been in a sleet storm before _____ 

Weather Reporter



Weather Reporter's Name _____

Today is _____.

The temperature outside right now is _____.

The high for today will be _____. The low for today will be _____.

Today will be (partly cloudy, cloudy, rainy, windy, sunny, snowy) _____ with a chance of (snow, rain, wind, sleet, hail) _____.

The cloud formation outside is (good weather, rainy or stormy clouds) _____.

The barometer is (high, low, average) _____ today.

The wind vane is pointing (North, South, East, West) _____.

The anemometer is/is not spinning today. It is moving (fast, slow) _____.

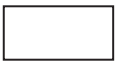
Suggested clothing for today would be _____.

Name _____

Shape Walk

Circle 

Square 

Rectangle 

Triangle 

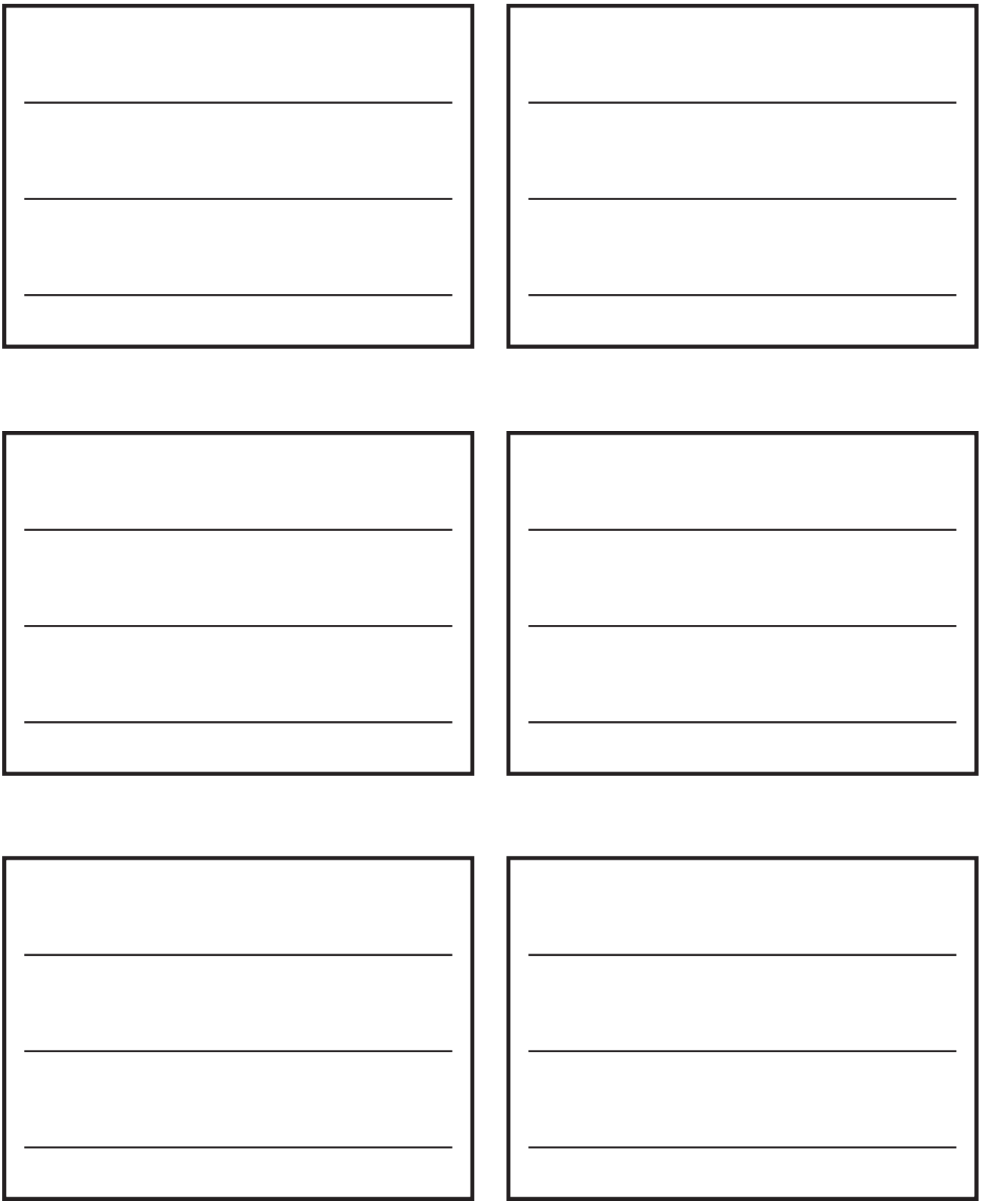
Trapezoid 

Hexagon 

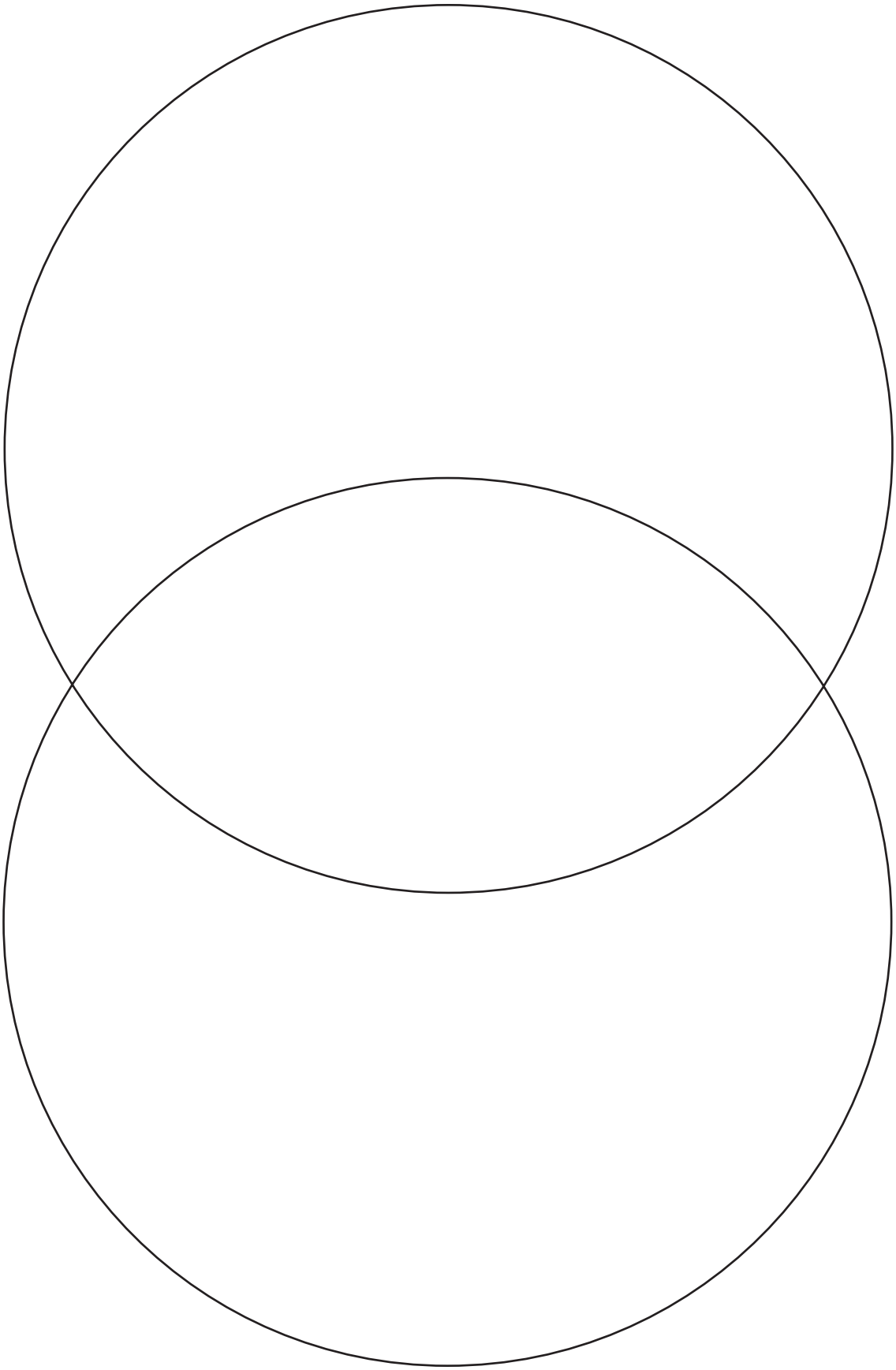
Cube 

Sphere 

Picture Dictionary



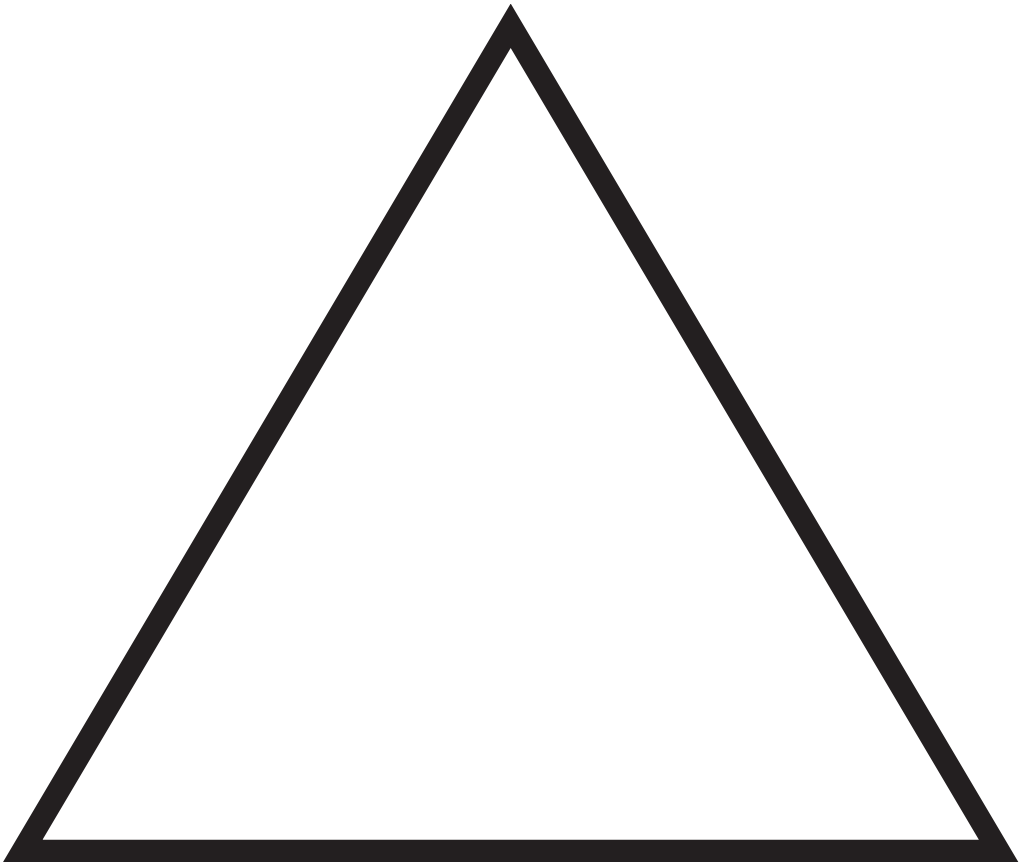
Venn Diagram

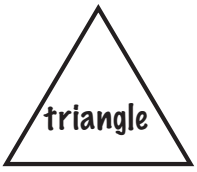


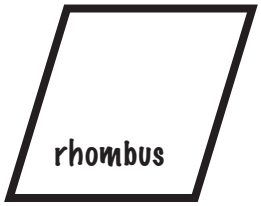
Mathematical Team

Word	Definition
Picture	Example

Triangle Cover-up



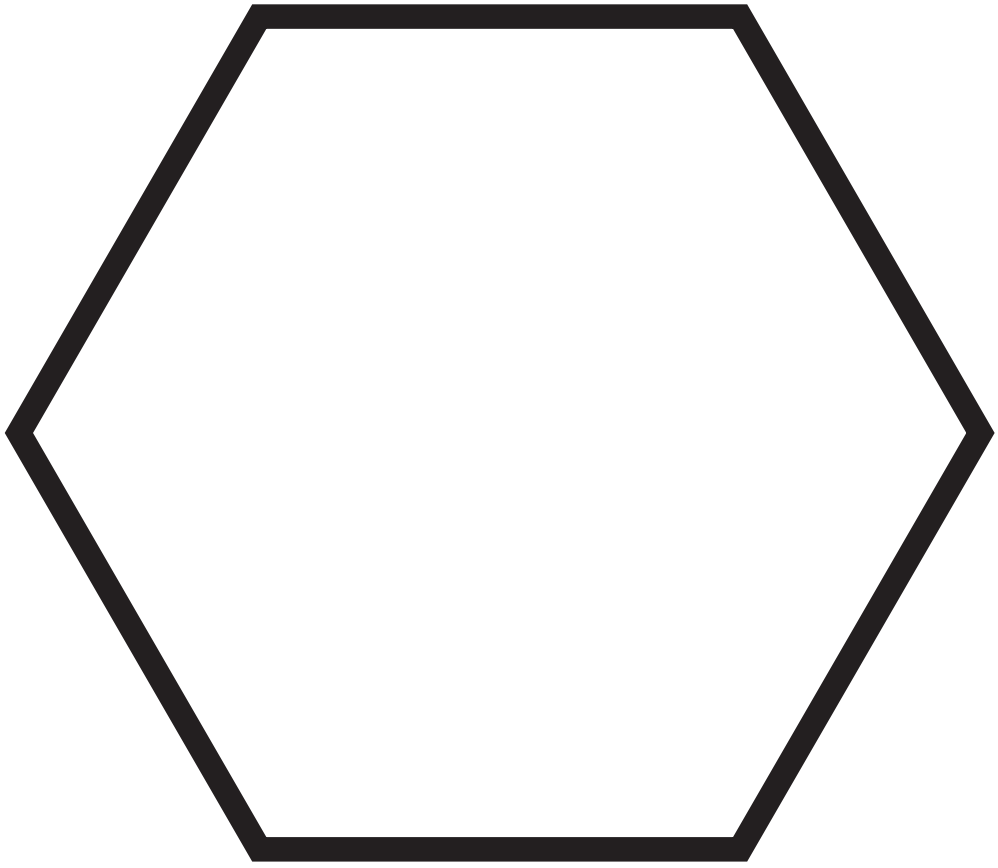


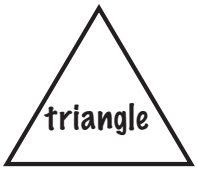


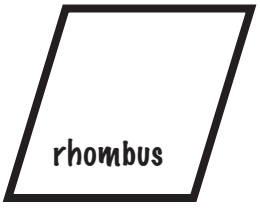
1st Try				
2nd Try				

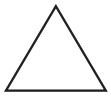
Name _____

Hexagon Cover-up







				
1st Try				
2nd Try				

Name _____

Shape Detectives

Card 1		Card 6	
Card 2		Card 7	
Card 3		Card 8	
Card 4		Card 9	
Card 5		Card 10	

Name _____

Shape Detectives

Card 1		Card 6	
Card 2		Card 7	
Card 3		Card 8	
Card 4		Card 9	
Card 5		Card 10	

Inchworm Measurement

Classroom Object	Estimate of Length	Actual Length

Name _____

Bean Flip

Directions: Flip the bean carefully across the top of your desk. Estimate how far it traveled. Take an actual measurement using a ruler or measuring tape. Record the difference.

Trial	Estimate	Actual	Difference
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

Name _____

Crazy Cups

Item	Estimate in cups	Actual cups
1.		
2.		
3.		
4.		
5.		

Name _____

Time Capsule

Date _____ Time _____

List all of the ways that you can think of to sort rocks.

Rock Bingo

		FREE		

Mystery Rock

Mystery Box #1

The mystery rock in this box could be used for...

This mystery rock is really SALT!

Geologists call it Halite.
It is used to season our food.
This rock dissolves in water.
This rock melts ice.

Mystery Rock

Mystery Box #2

The mystery rock in this box could be used for...

This mystery rock is really SAND!

Sand is melted to make glass.
It is used as an ingredient in concrete and stucco.
When it is glued to paper it makes sandpaper.

Mystery Rock

Mystery Box #3

The mystery rock in this box could be used for...

This mystery rock is really GRANITE!

It is a very hard rock.
It is polished and used for countertops.
It can also be used in buildings, statues, and headstones.

Mystery Rock

Mystery Box #4

The mystery rock in this box could be used for...

This mystery rock is really PUMICE!

This rock can float.
It is an ingredient in pink rubber erasers. It is ground up and used to make nail files and household cleaners.

Mystery Rock

Mystery Box #5

The mystery rock in this box could be used for...

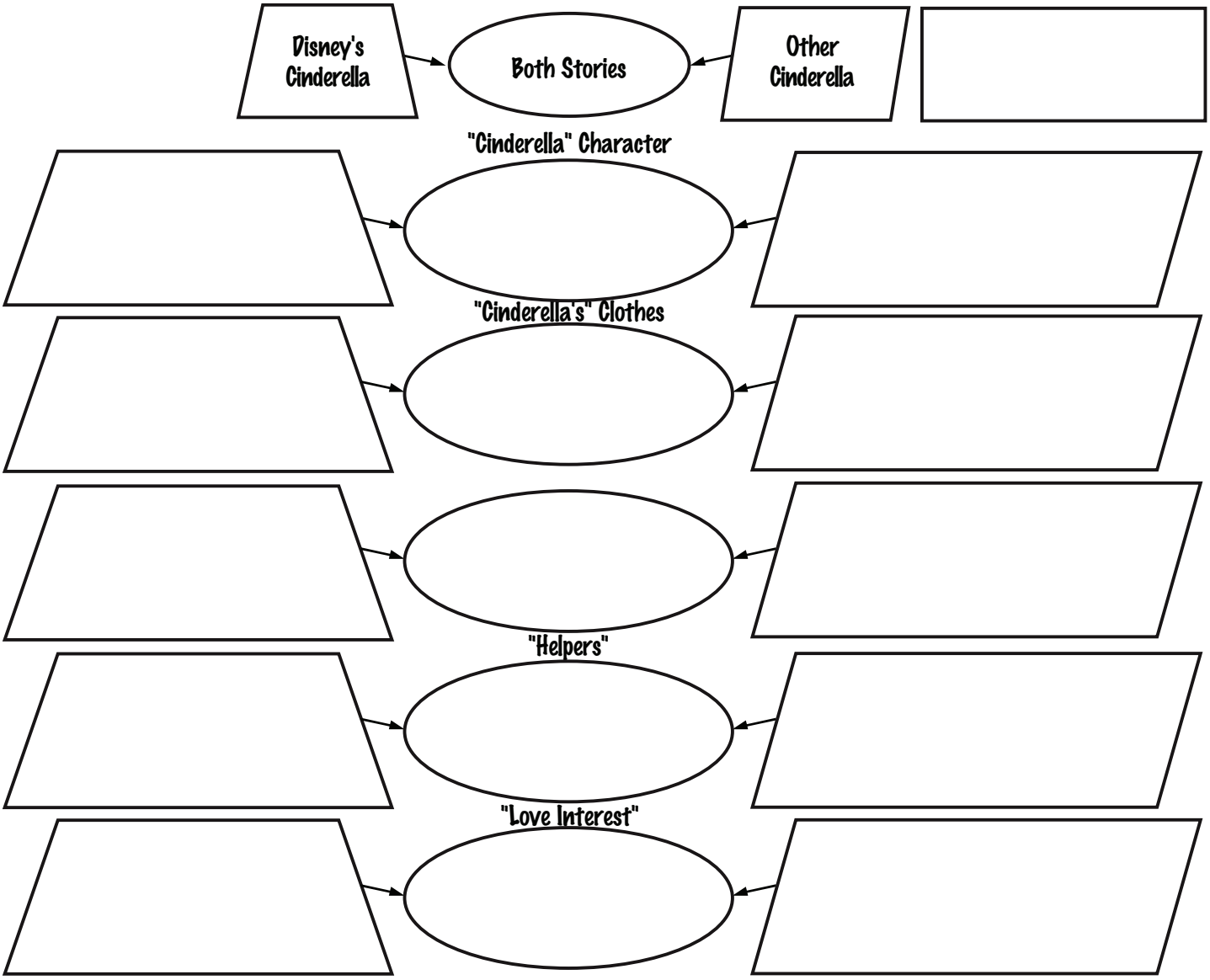
This mystery rock is really LIMESTONE!

Statues and buildings are made out of this rock. Soft limestone is used as chalk. Limestone is made out of broken-up and packed-down seashells.

Rock Opportunities

Second graders are naturally curious about the world around them. And here in Utah, we are surrounded by opportunities to learn more about rocks, fossils, and ancient rock art. Consider visiting some of these areas with your students to learn more:

Comparison Chart



Specific Cultural Aspects:

Student Participation Survey

	4 Always	3 Almost Always	2 Sometimes	1 Never
Did I do my jobs and was I prepared to meet and work with my group?				
Did I share information with my team that related to our assignment?				
Did I listen to everyone in the group and give everyone a chance to speak?				
Did I cooperate with my group and not argue with them?				

Other comments or concerns: